
Chapter 4: Diagnosing faults

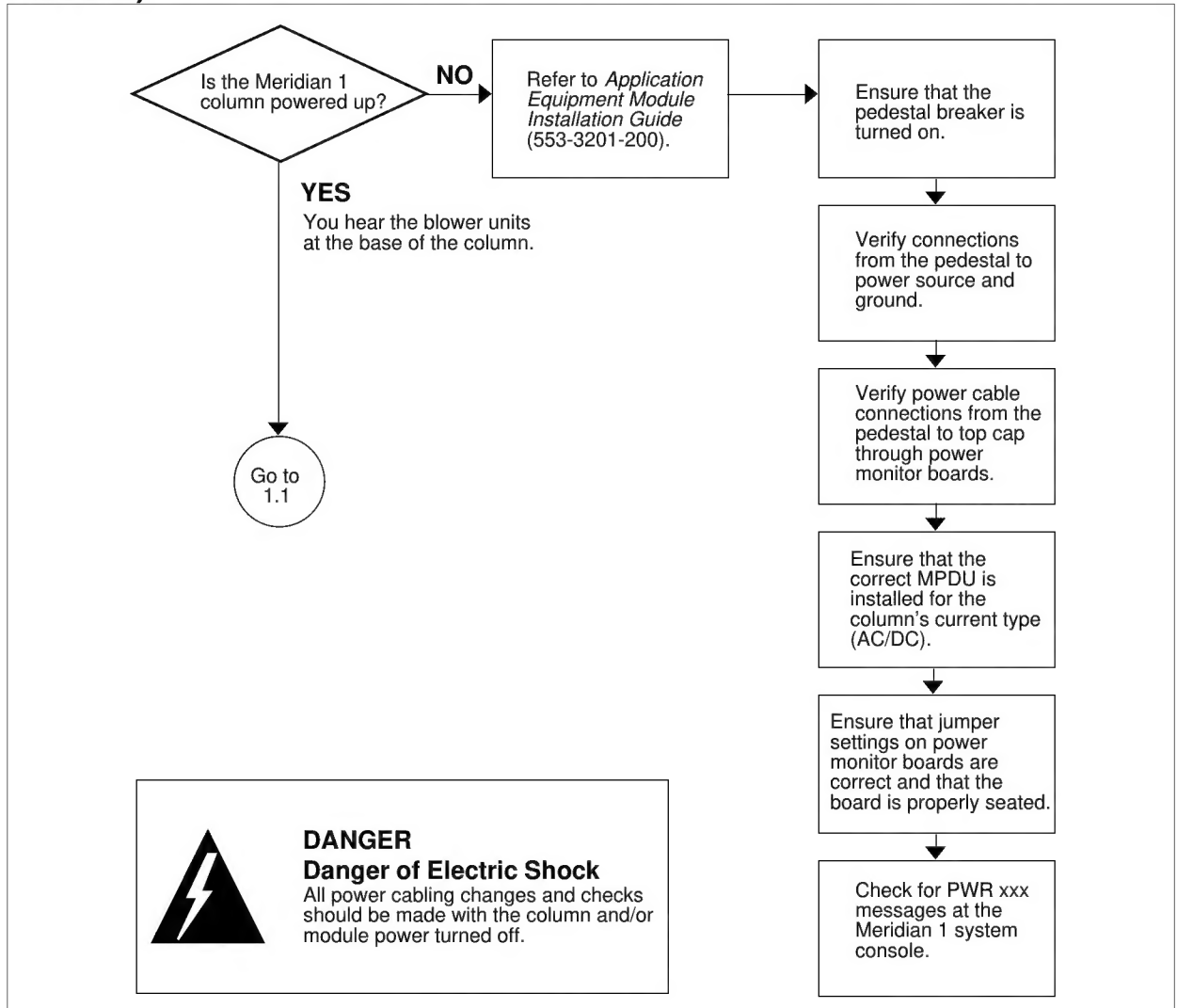
The procedures in this chapter enable you to locate the source of a problem with your Application Module or IPE Module or related devices. To use the procedures, start with the following “Quick reference fault isolation” checklist. Go through each question in turn, and if you answer no to one question, proceed to the diagnostic procedure recommended.

Follow the diagnostic procedures step by step, until the problem is diagnosed and fixed. In some cases, you are referred to specific recovery or replacement procedures, which are described in Chapter 8, “Recovery/replacement procedures.” If a problem persists, contact your Nortel support personnel.

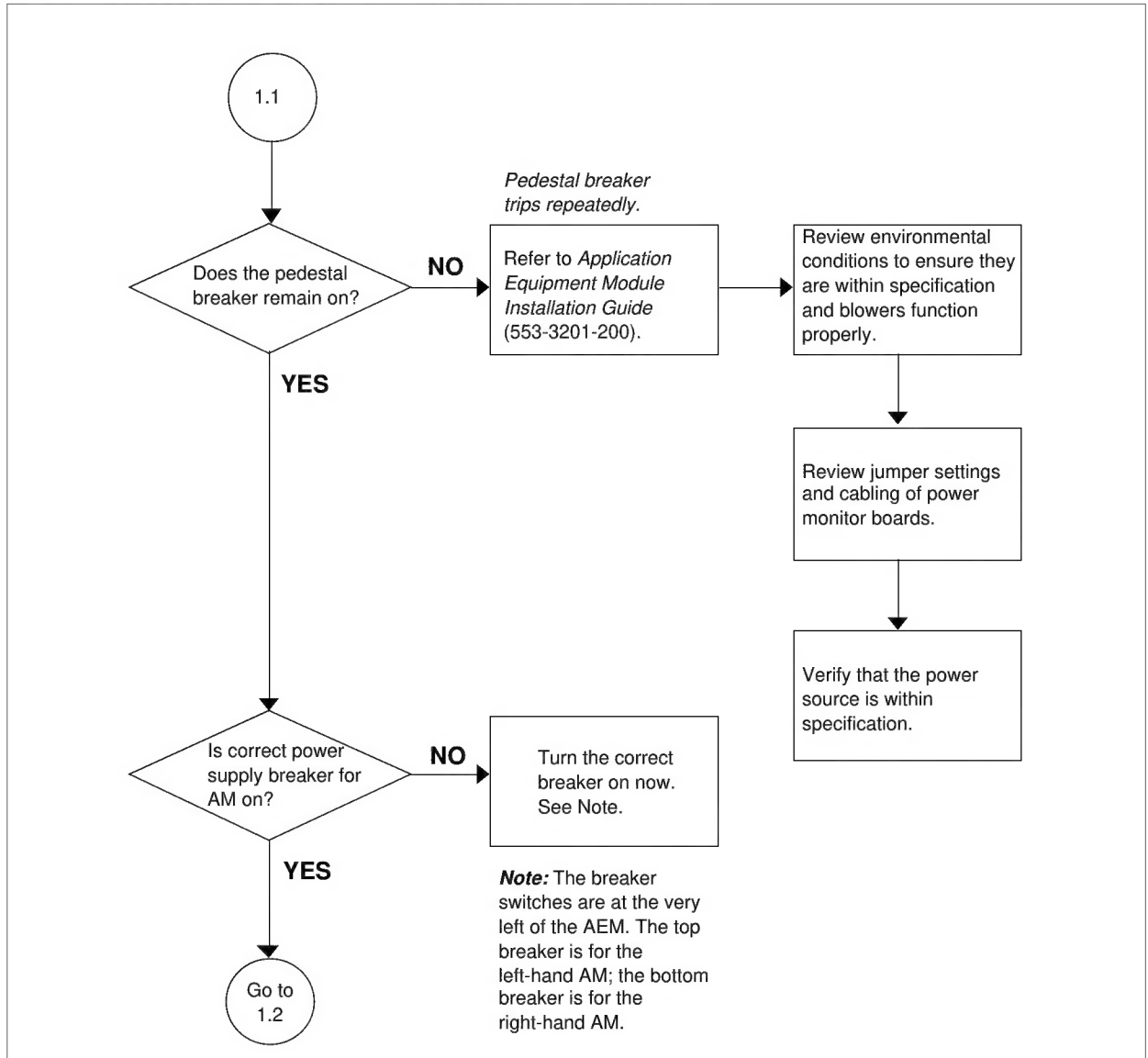
Quick reference fault isolation

Verify this:	If not, go to diagnostic procedure:
Is the module powered up?	1: Power fault suspected (Application Module) or 2: Power fault suspected (IPE Module)
Are there any apparent hardware faults?	3 and 4: Card fault suspected
Is the system console operational?	5: System console fault suspected
Is the system start-up successful?	6: System start-up problem
If appropriate, can you dial in from a remote terminal?	7: Dial-up problem
Are all configured terminals operational?	8: Application terminal problem
Are all configured printers operational?	9: Printer faults

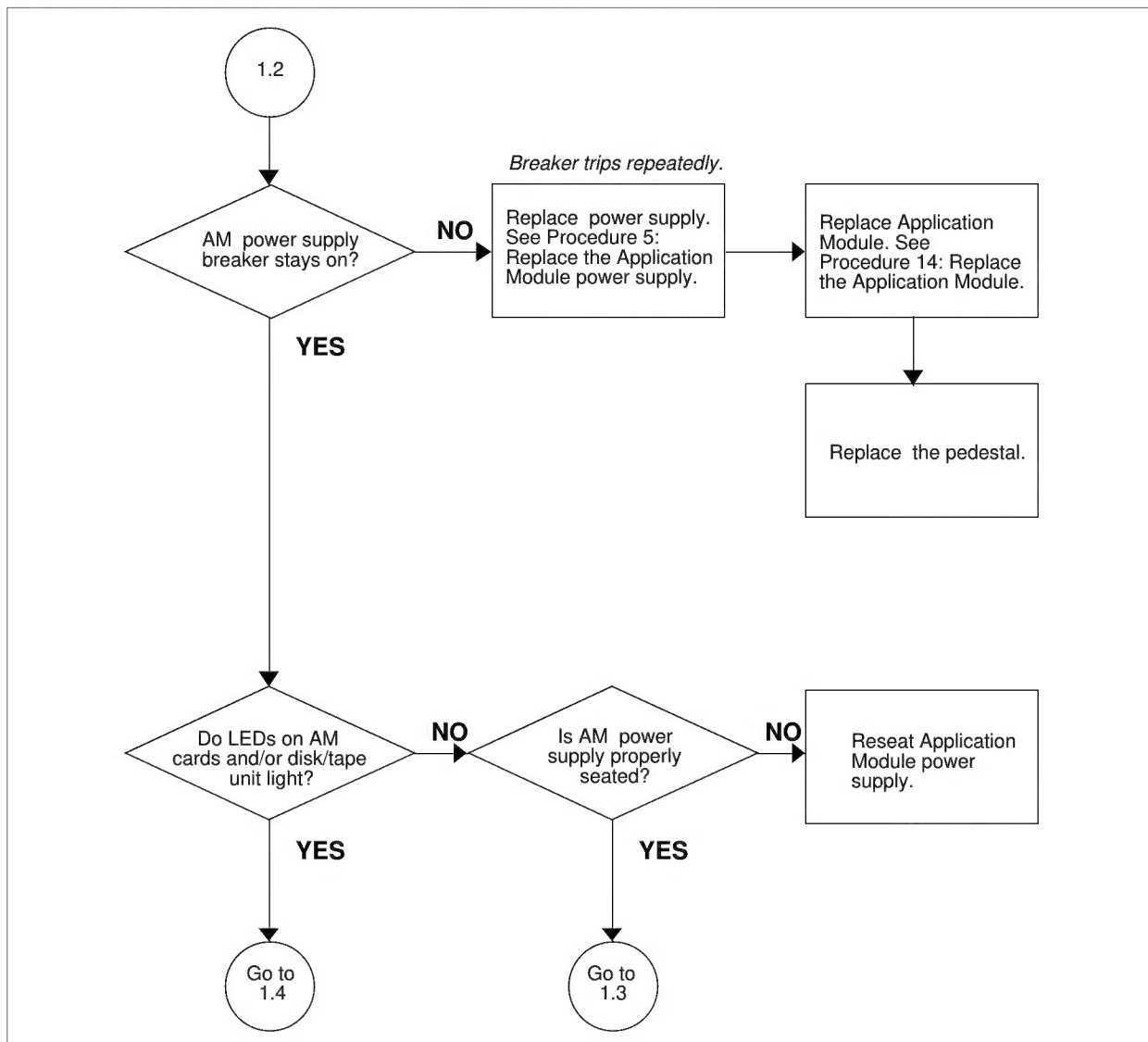
Diagnostic procedure 1: Power fault suspected (Application Module)



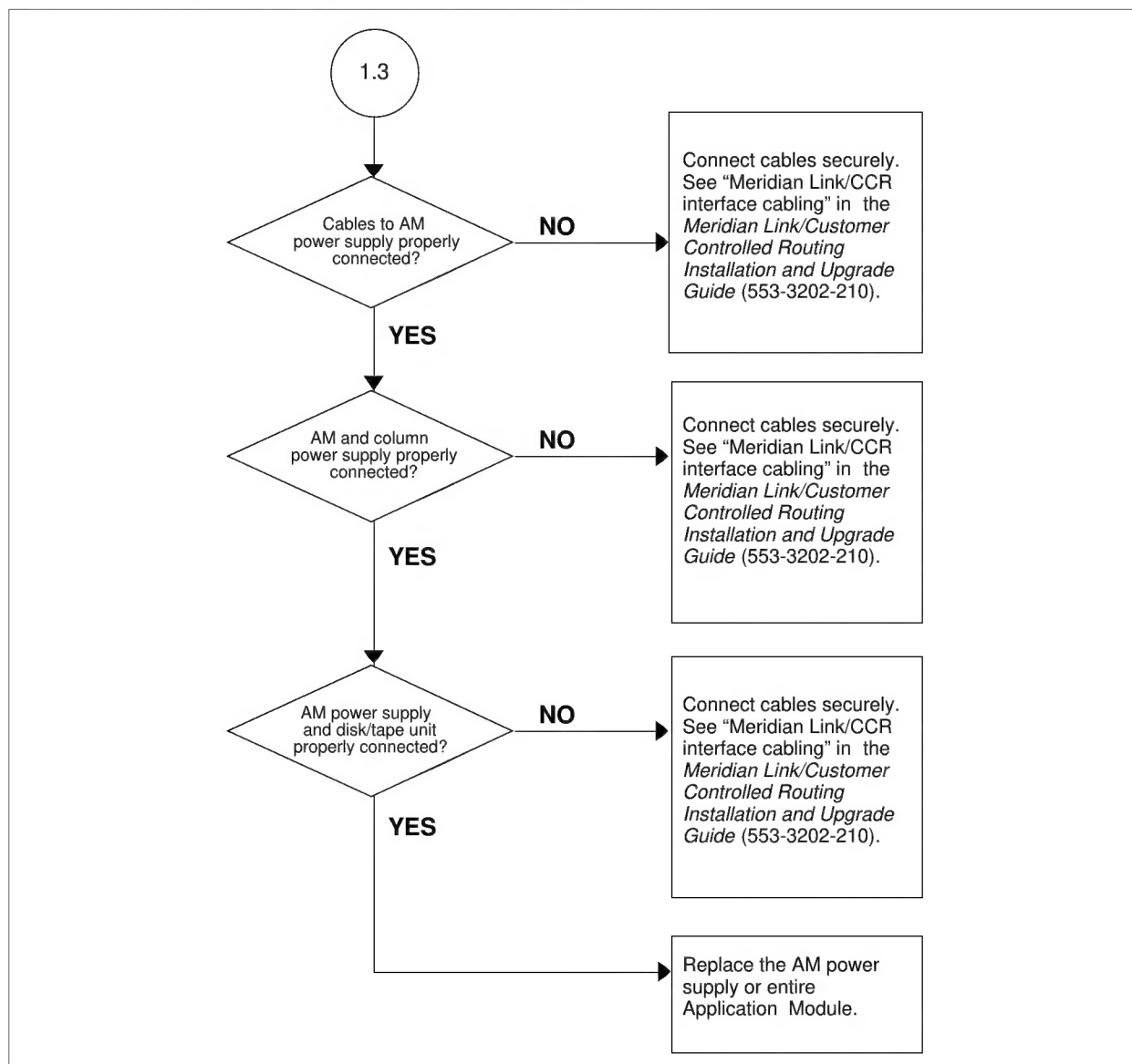
Diagnostic procedure 1
Power fault suspected (Application Module) (continued)



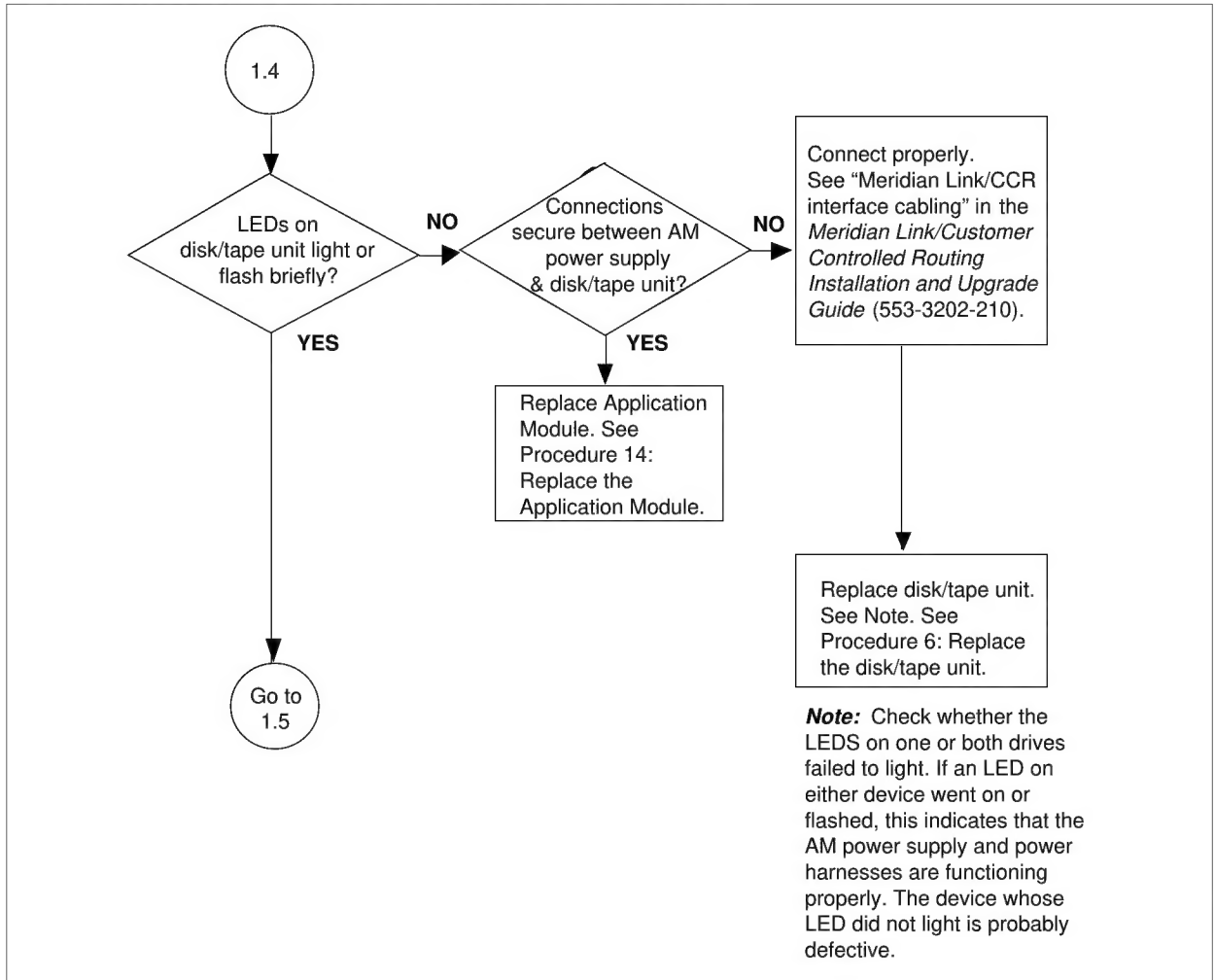
Diagnostic procedure 1
Power fault suspected (Application Module) (continued)



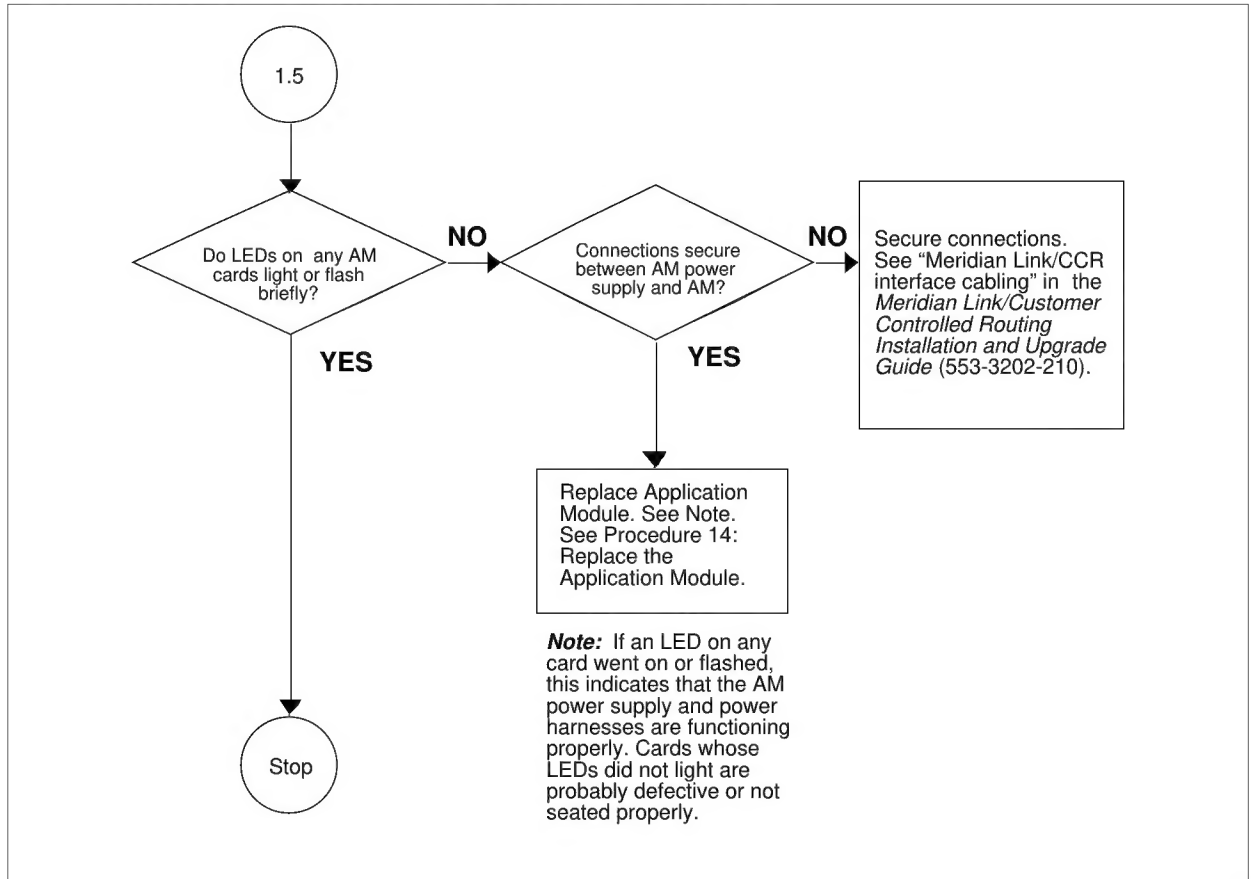
Diagnostic procedure 1
Power fault suspected (Application Module) (continued)



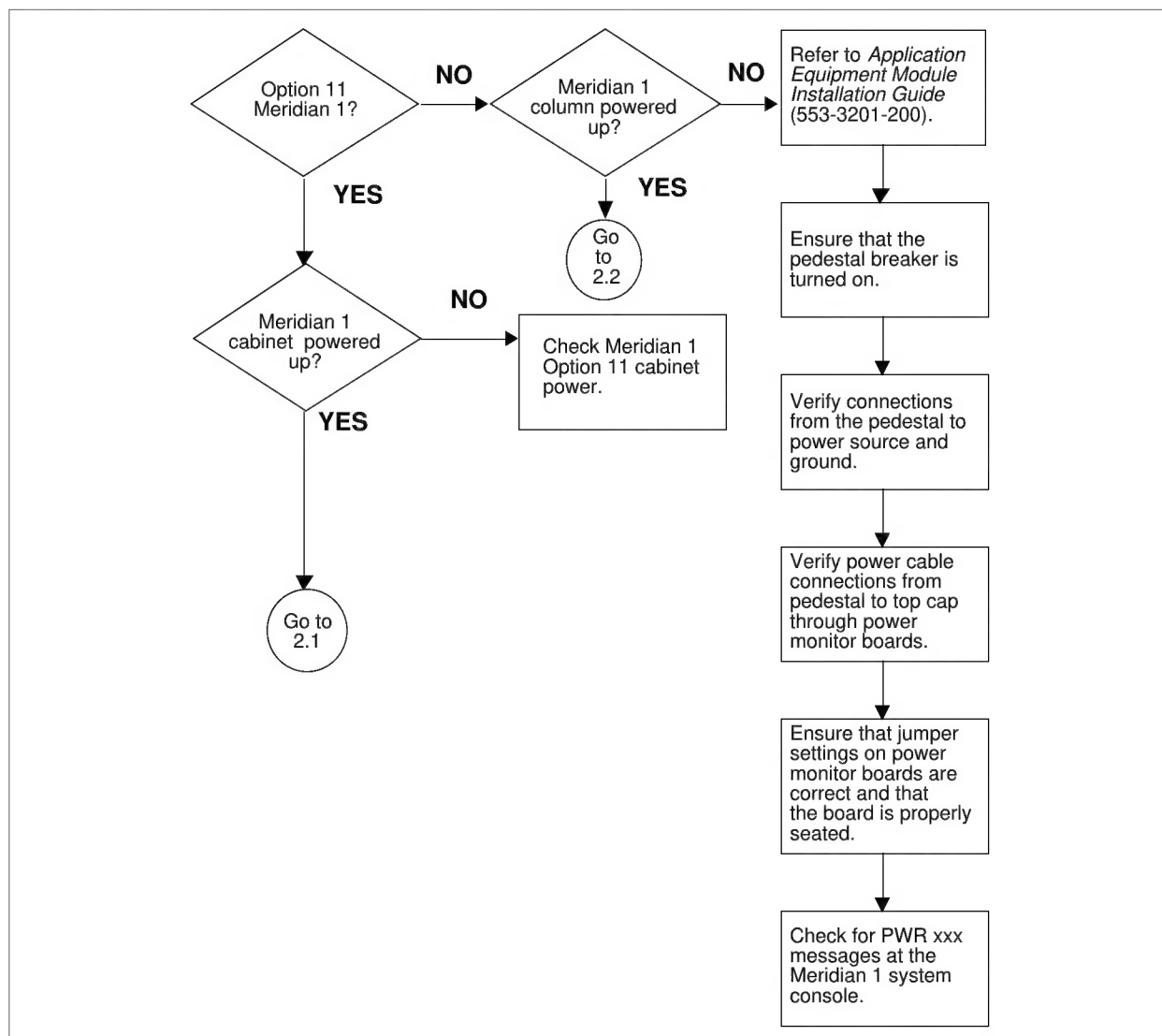
Diagnostic procedure 1
Power fault suspected (Application Module) (continued)



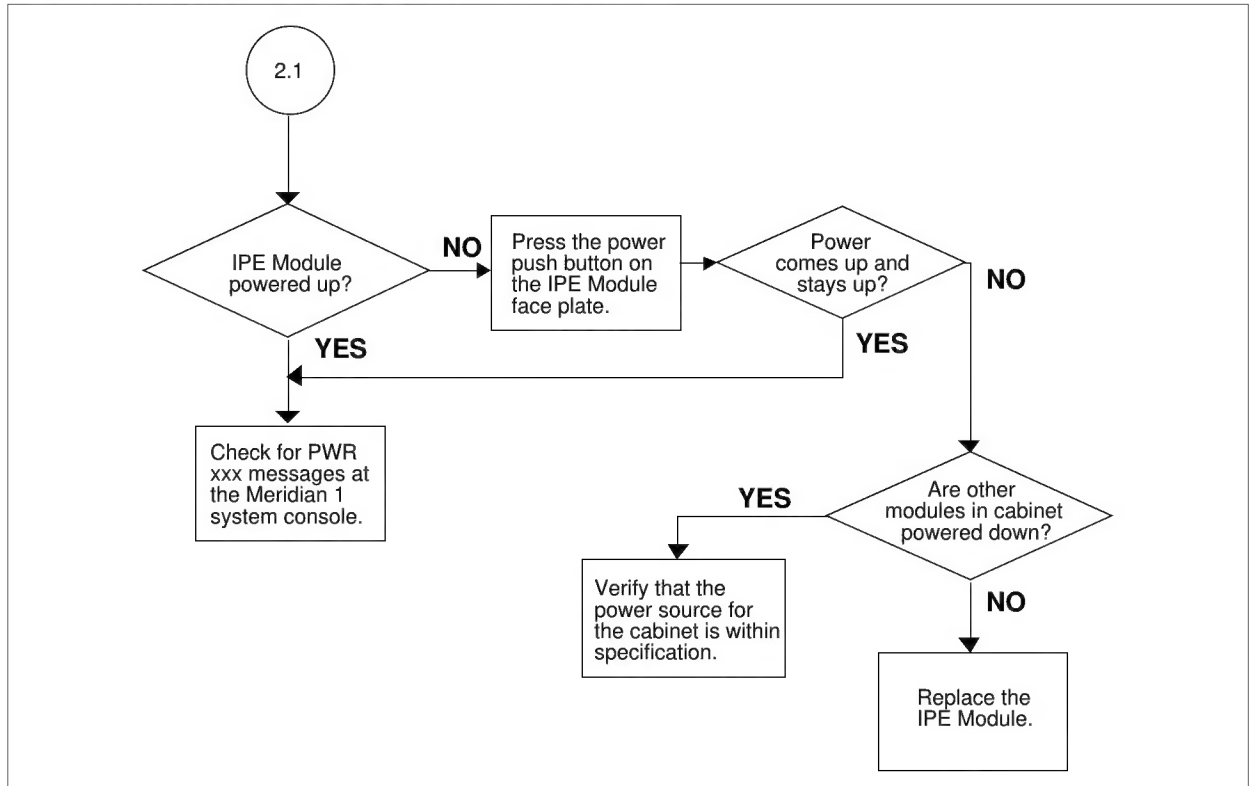
Diagnostic procedure 1
Power fault suspected (Application Module) (continued)



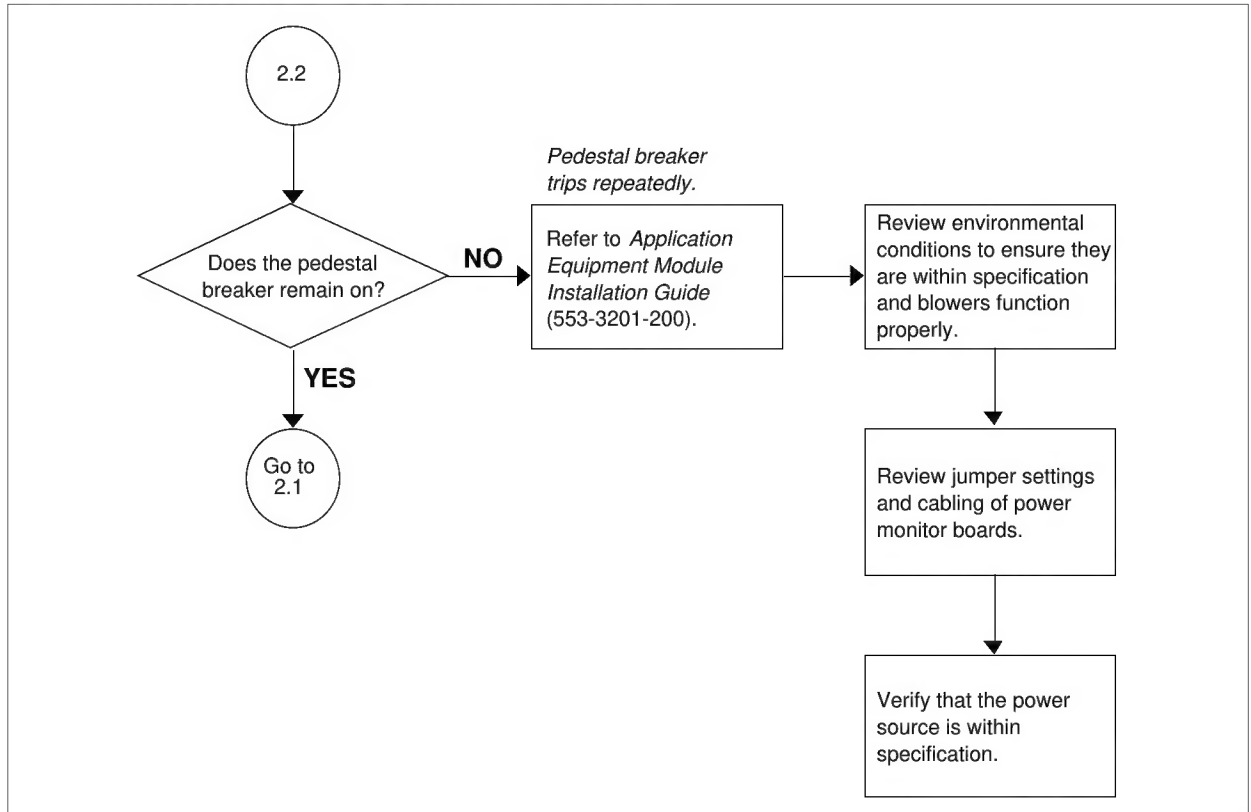
Diagnostic procedure 2: Power fault suspected (IPE Module)



Diagnostic procedure 2
Power fault suspected (IPE Module) (continued)

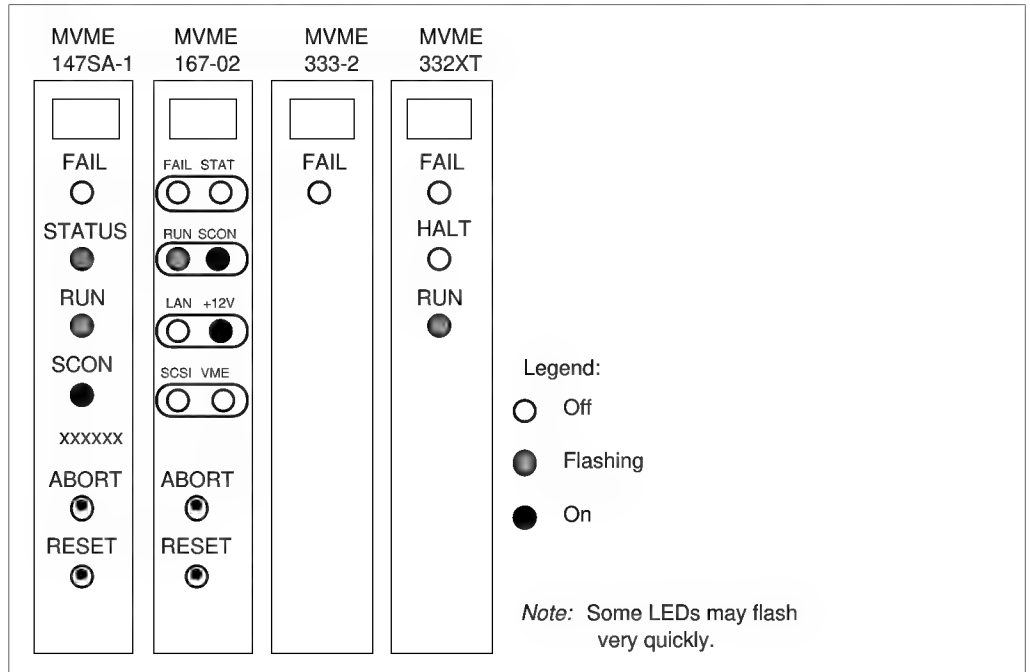


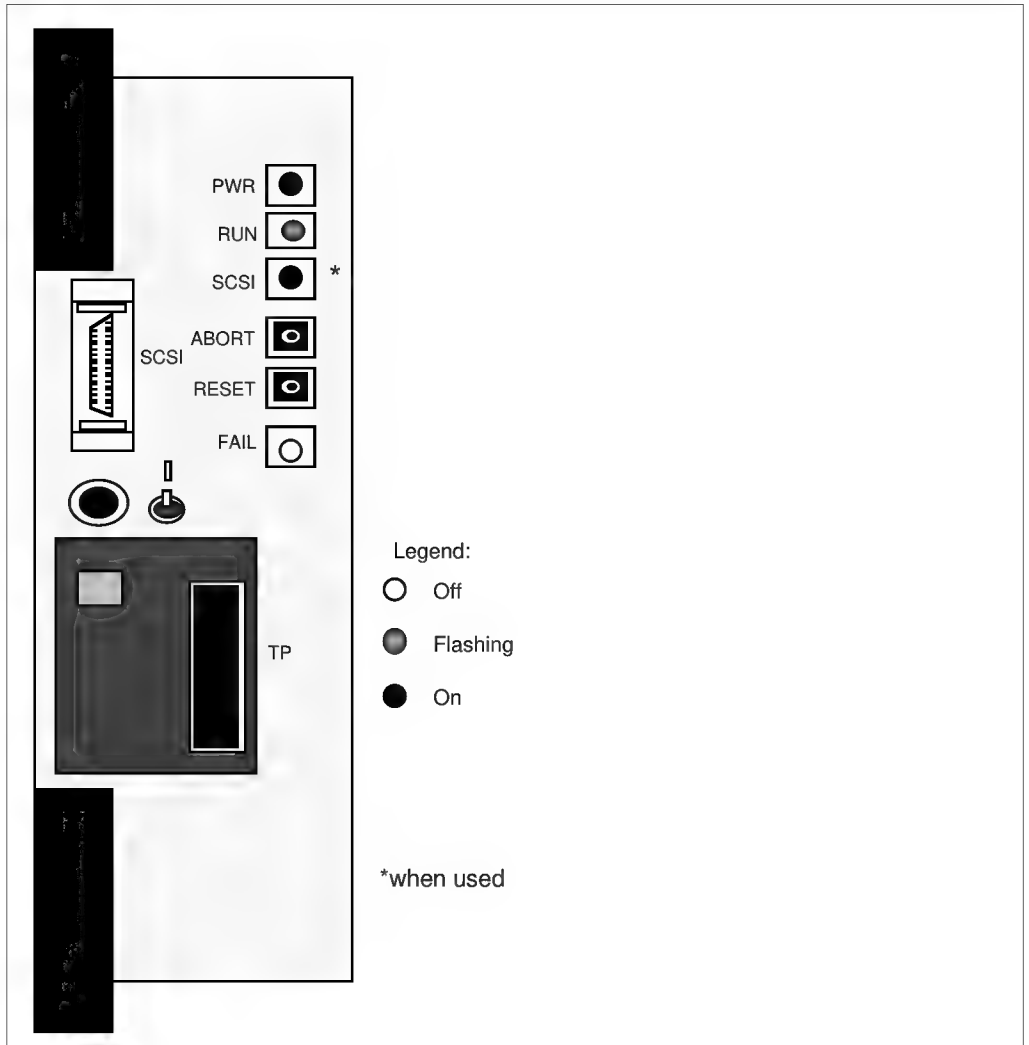
Diagnostic procedure 2
Power fault suspected (IPE Module) (continued)



Diagnostic procedures 3 and 4: Card fault suspected

Refer to the following figures for status information on LED indicators at the front of the Application Module and IPE Module.





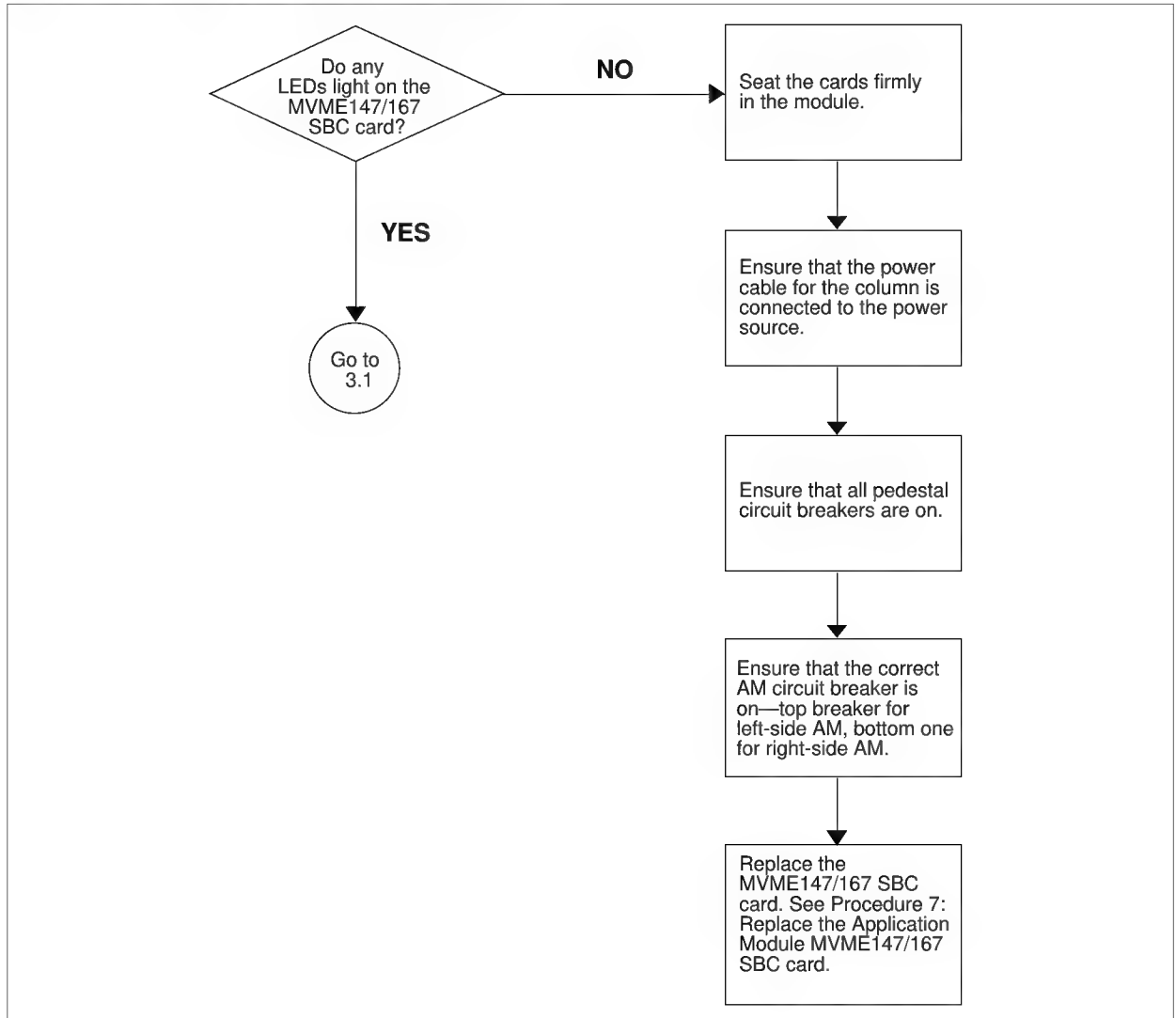
Reseating a card

To reseat a card, remove the card using the extractors at top and bottom. Pull out several inches. Using both hands, push in firmly, applying pressure to the center of the card where the screw is located, until faceplate is flush with adjacent cards and extractors have returned to level position.

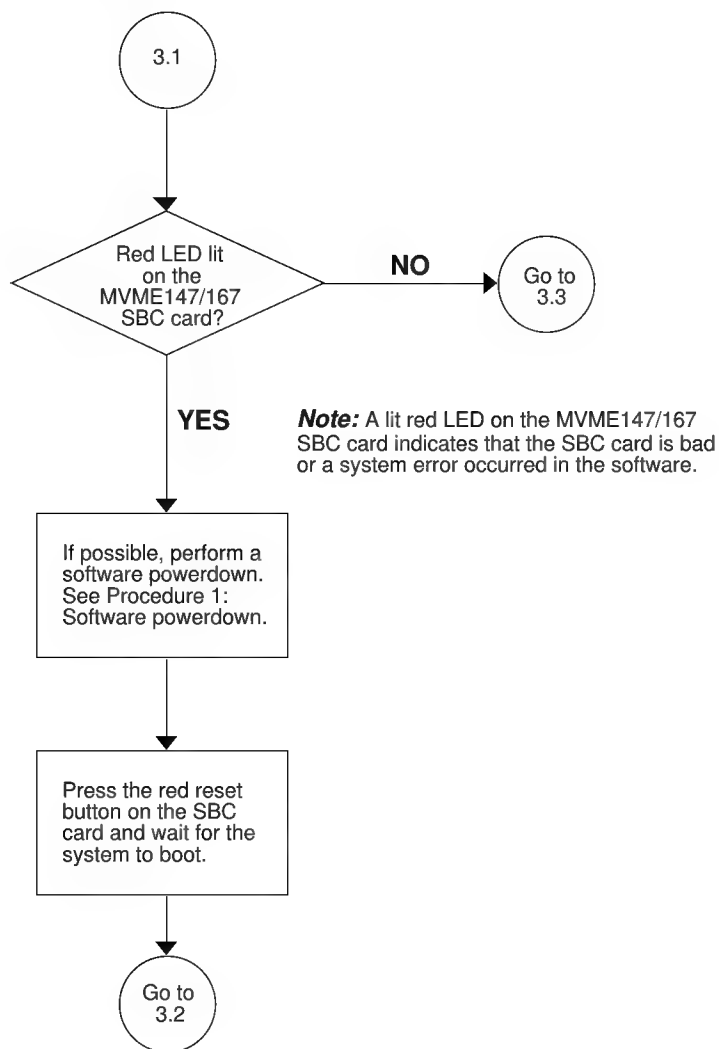
Advanced diagnostic tests

In some cases, further troubleshooting is possible on hardware problems. More technical diagnostic tests are available to some users, as described in the *Application Module and Intelligent Peripheral Equipment Module Advanced Maintenance Guide* (NTP 553-3211-512).

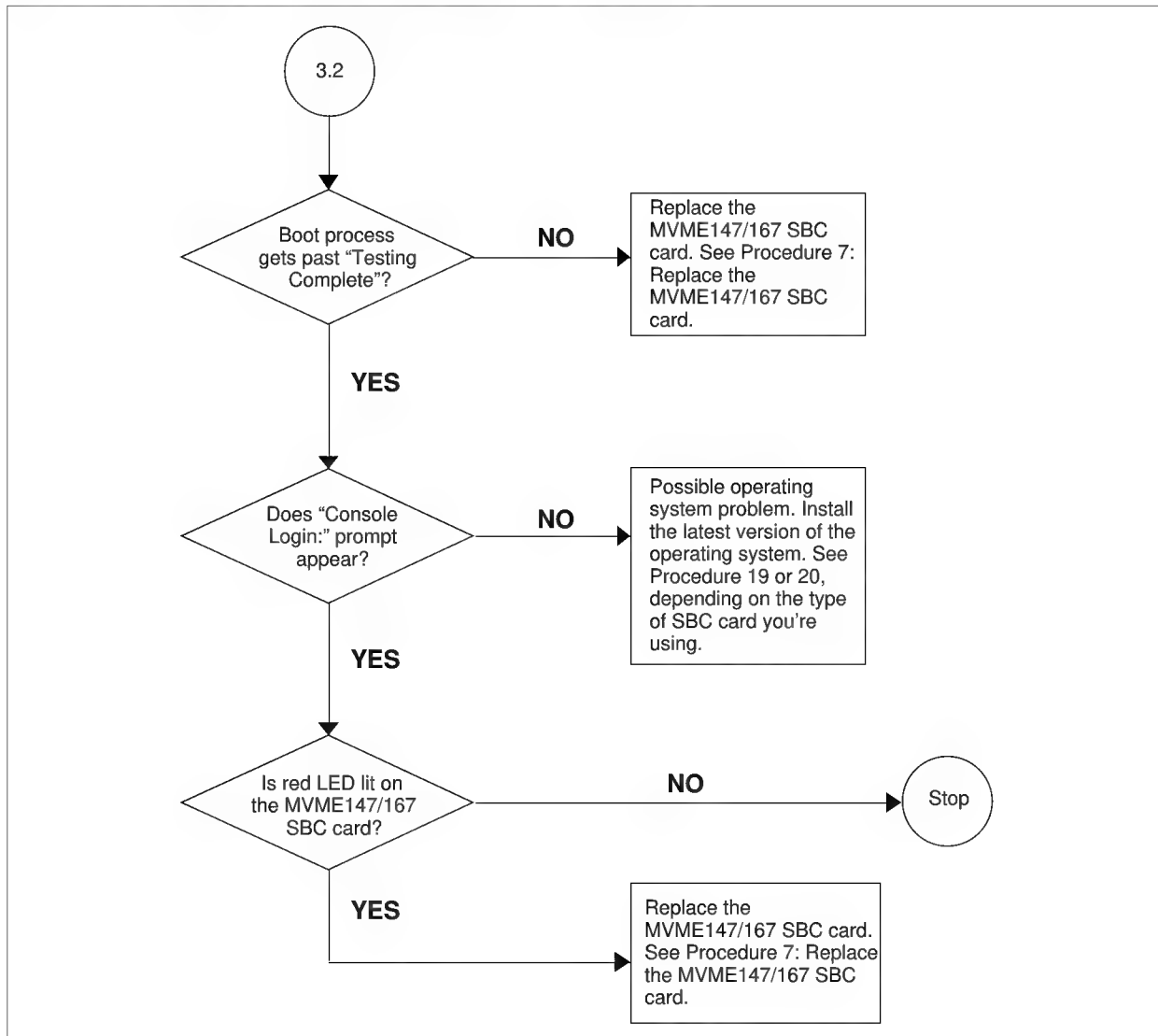
Diagnostic procedure 3
Card fault suspected (Application Module)



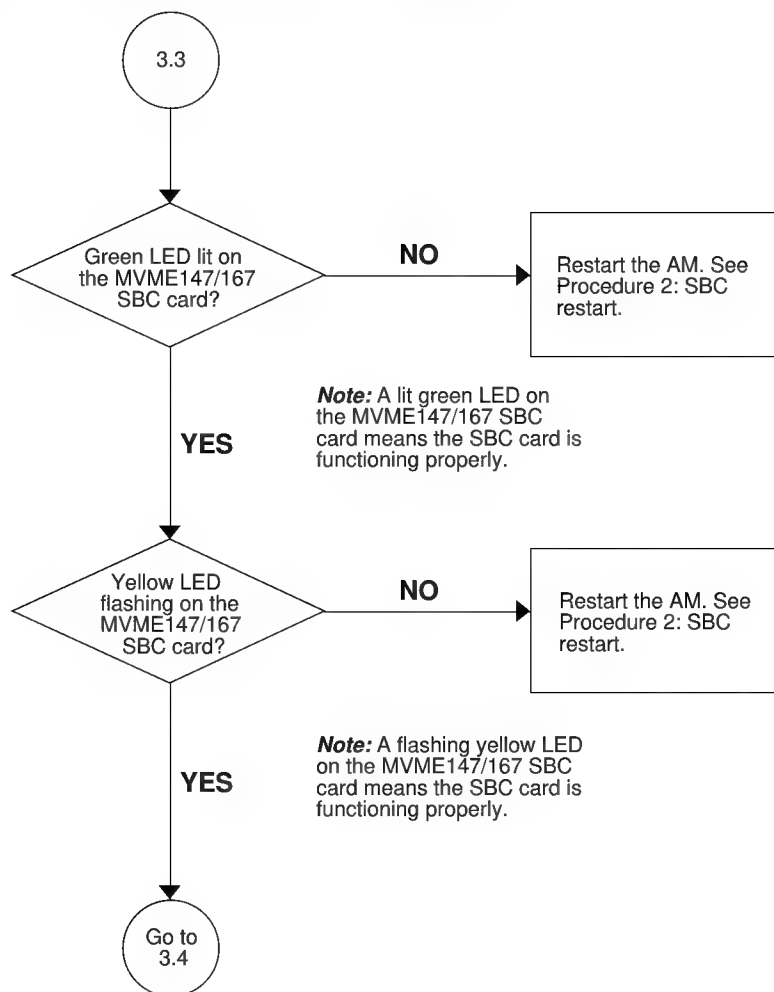
Diagnostic procedure 3
Card fault suspected (Application Module) (continued)



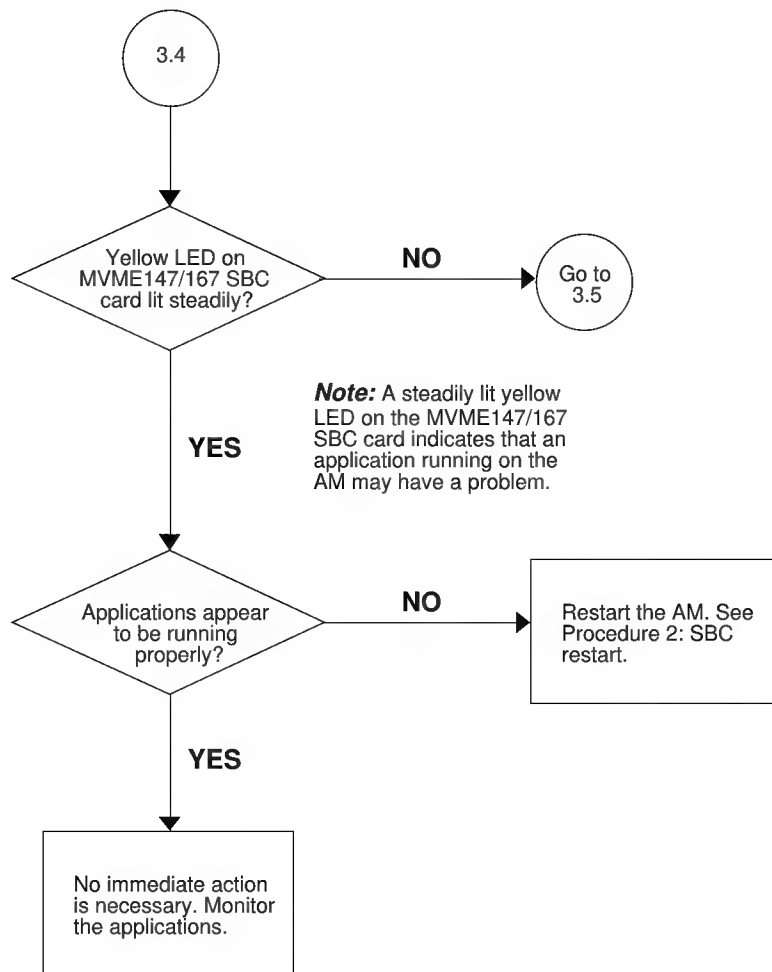
Diagnostic procedure 3
Card fault suspected (Application Module) (continued)



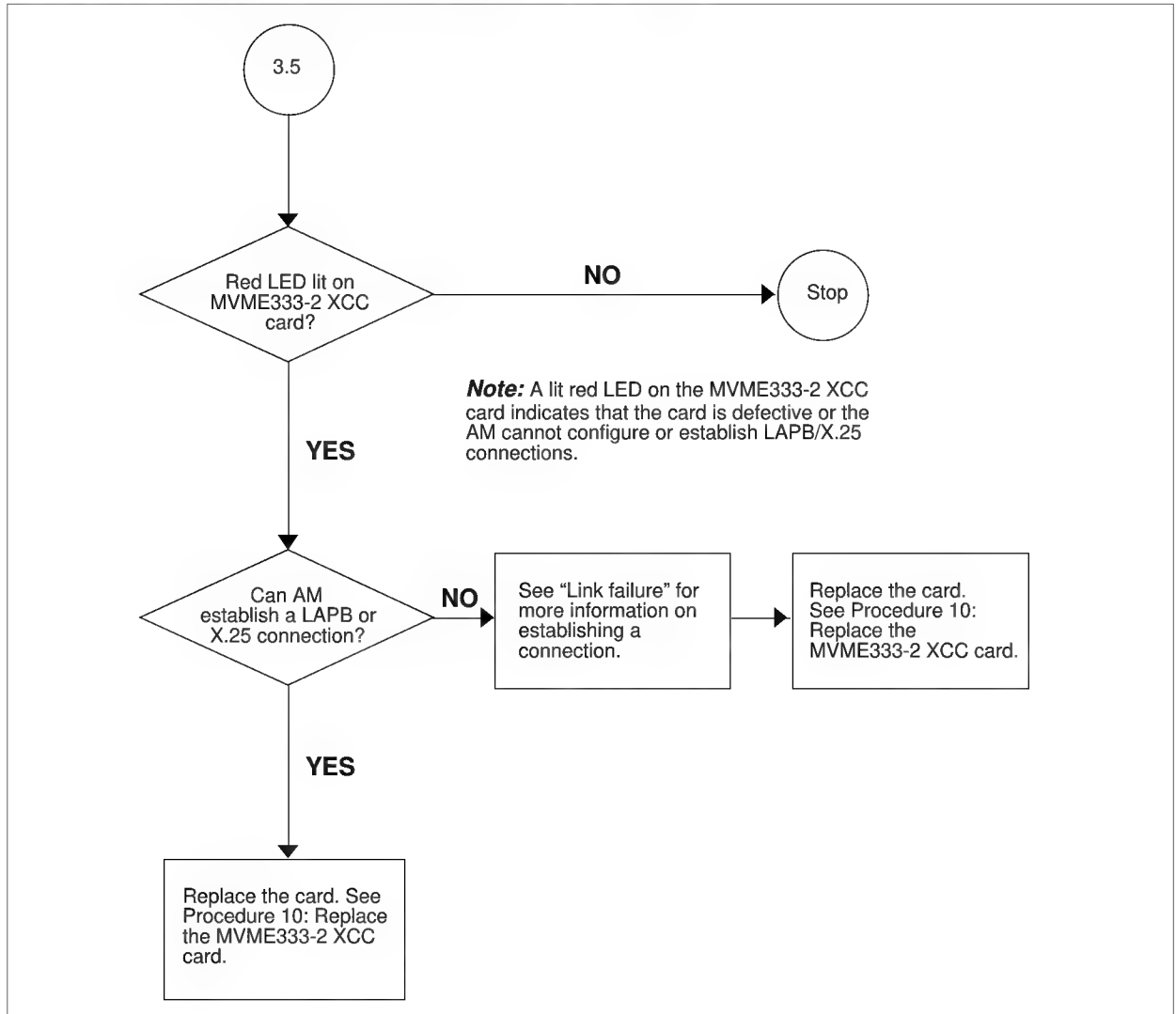
Diagnostic procedure 3
Card fault suspected (Application Module) (continued)



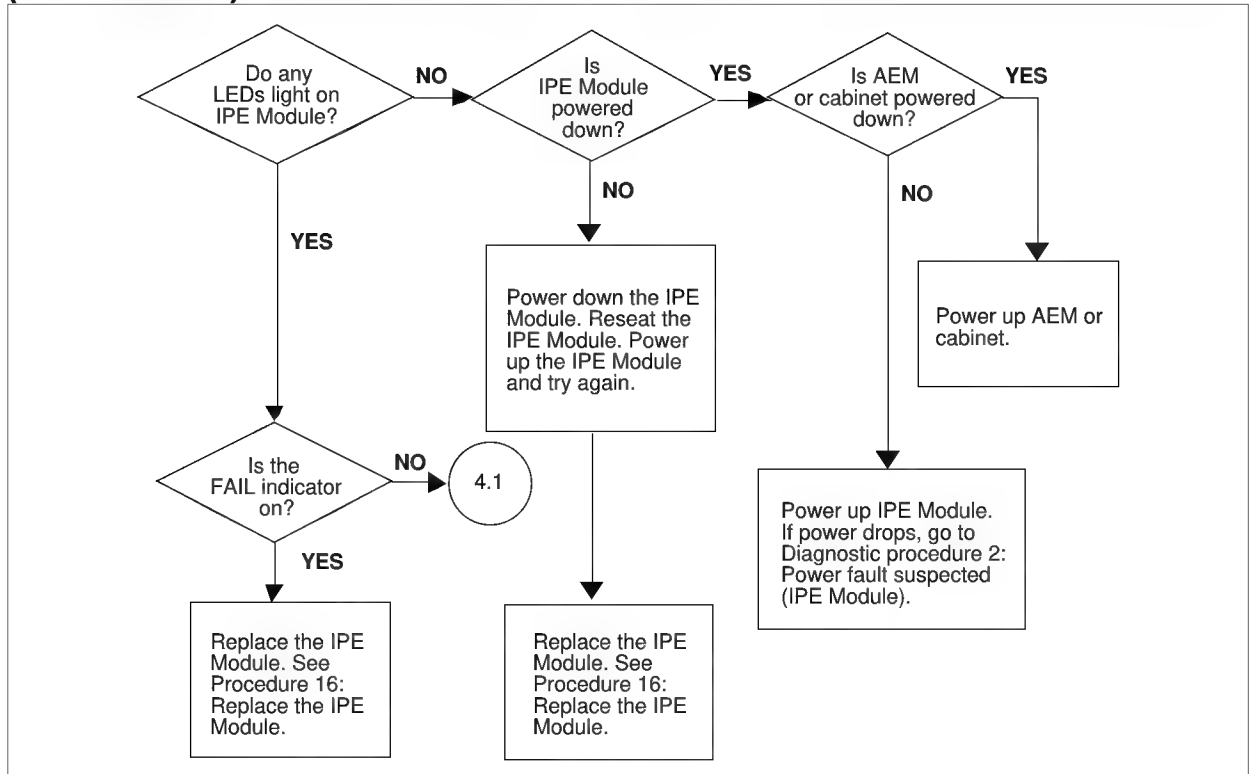
Diagnostic procedure 3
Card fault suspected (Application Module) (continued)



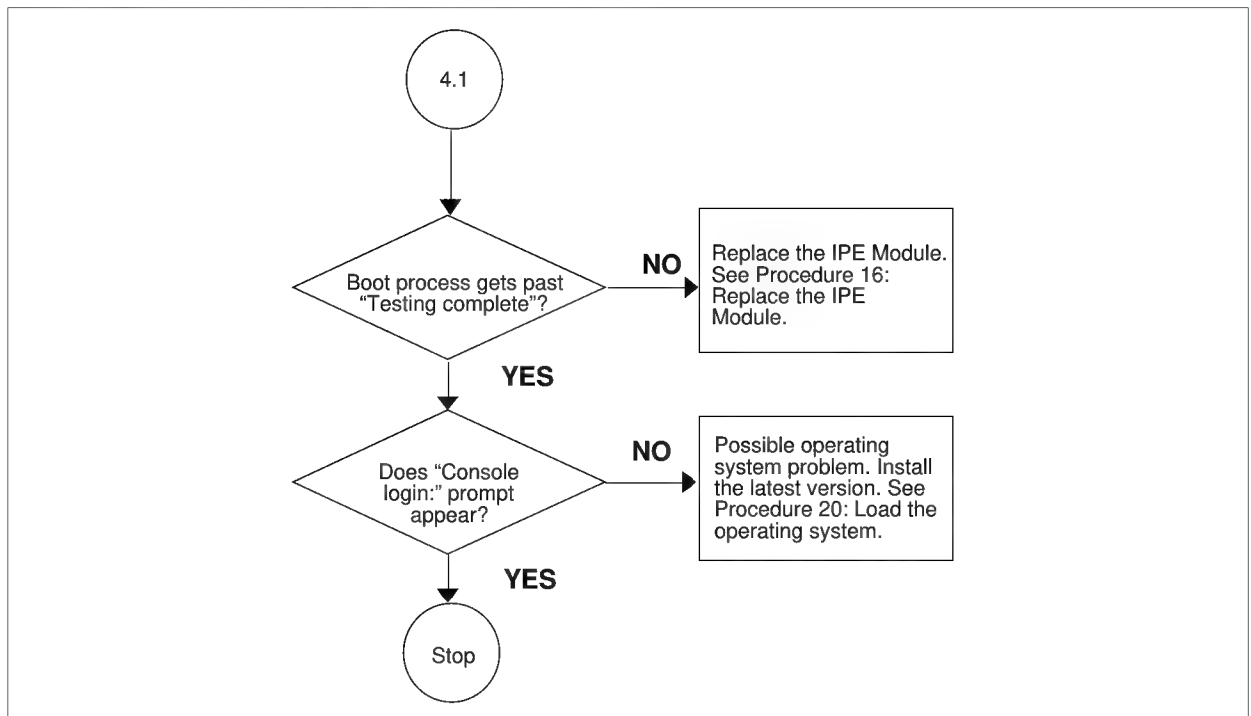
Diagnostic procedure 3
Card fault suspected (Application Module) (continued)



Diagnostic procedure 4: Card fault suspected (IPE Module)



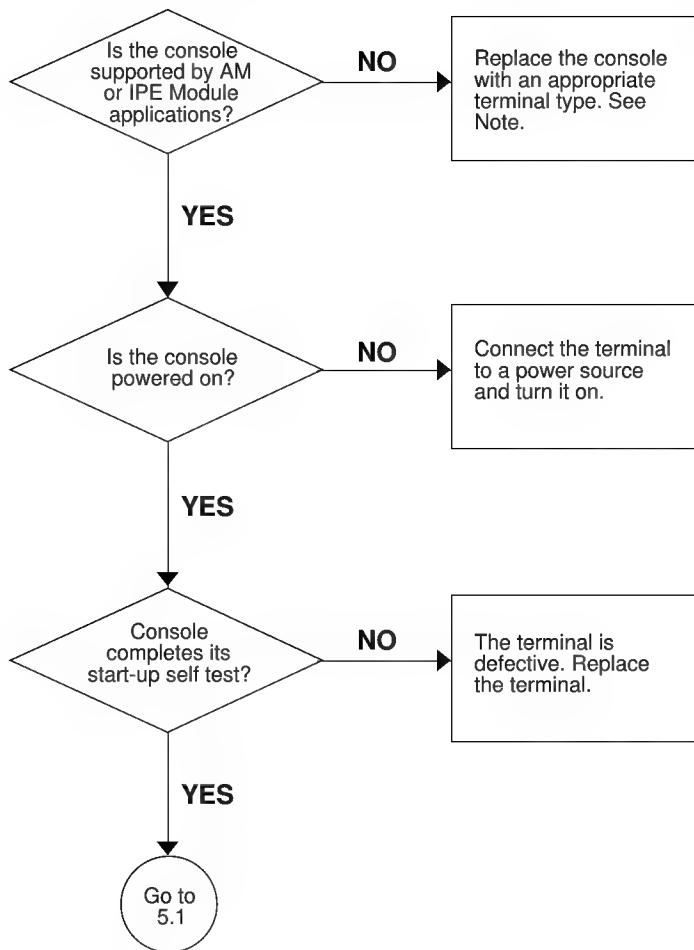
Diagnostic procedure 4 Card fault suspected (IPE Module) (continued)



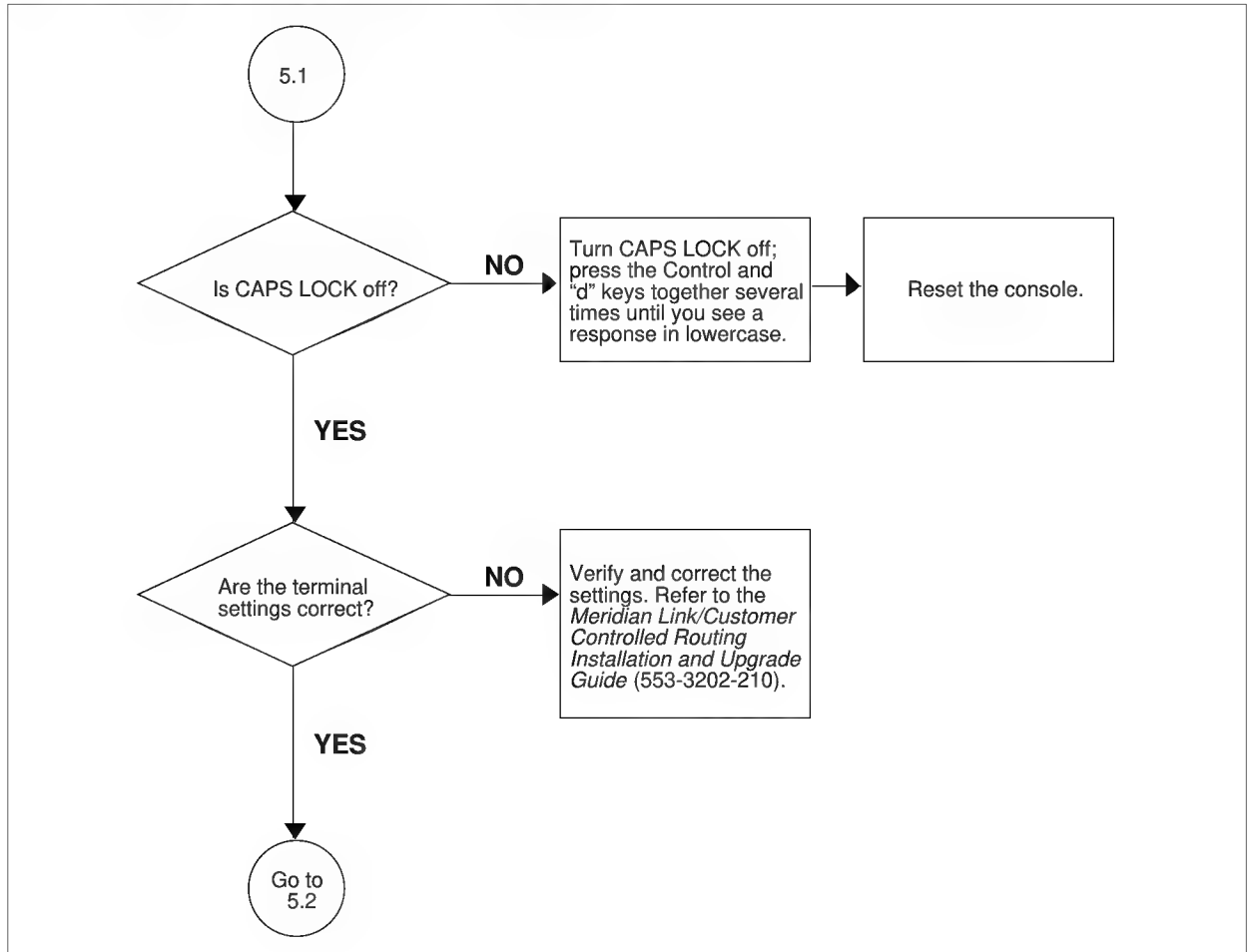
Diagnostic procedure 5: System console fault suspected

This procedure applies to the system console only.

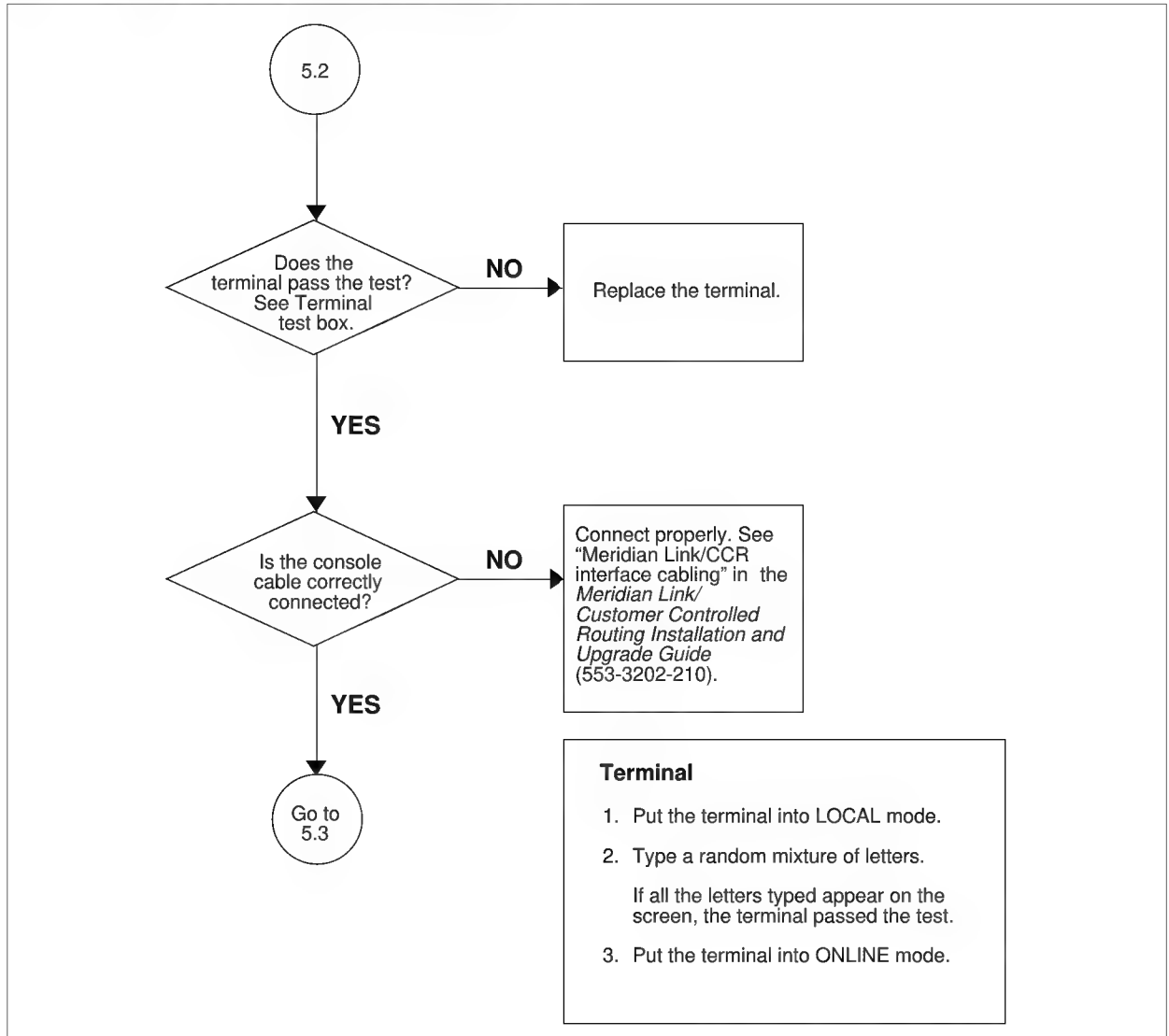
Note: The supported console terminal type is a DEC VT220 or 100% compatible terminal (for example, a PC running Reflection 4+).



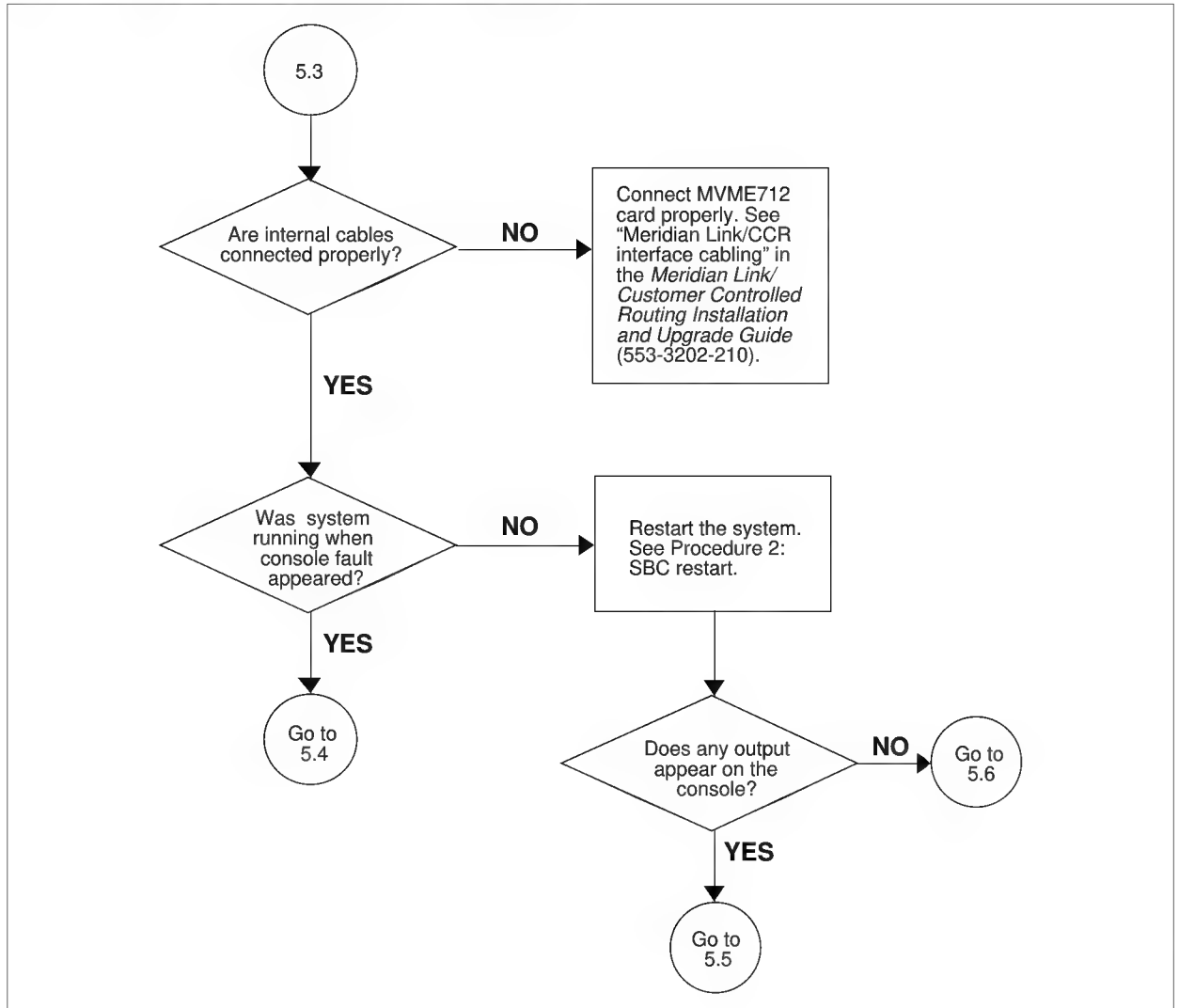
Diagnostic procedure 5
System console fault suspected (continued)



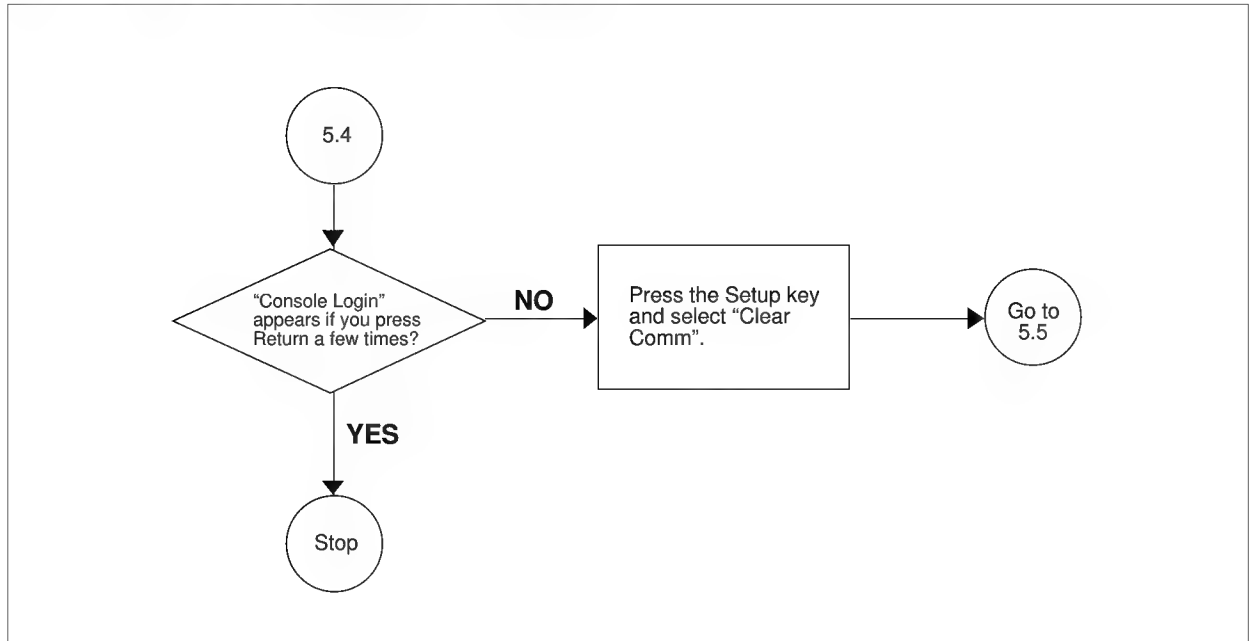
Diagnostic procedure 5
System console fault suspected (continued)



Diagnostic procedure 5
System console fault suspected (continued)

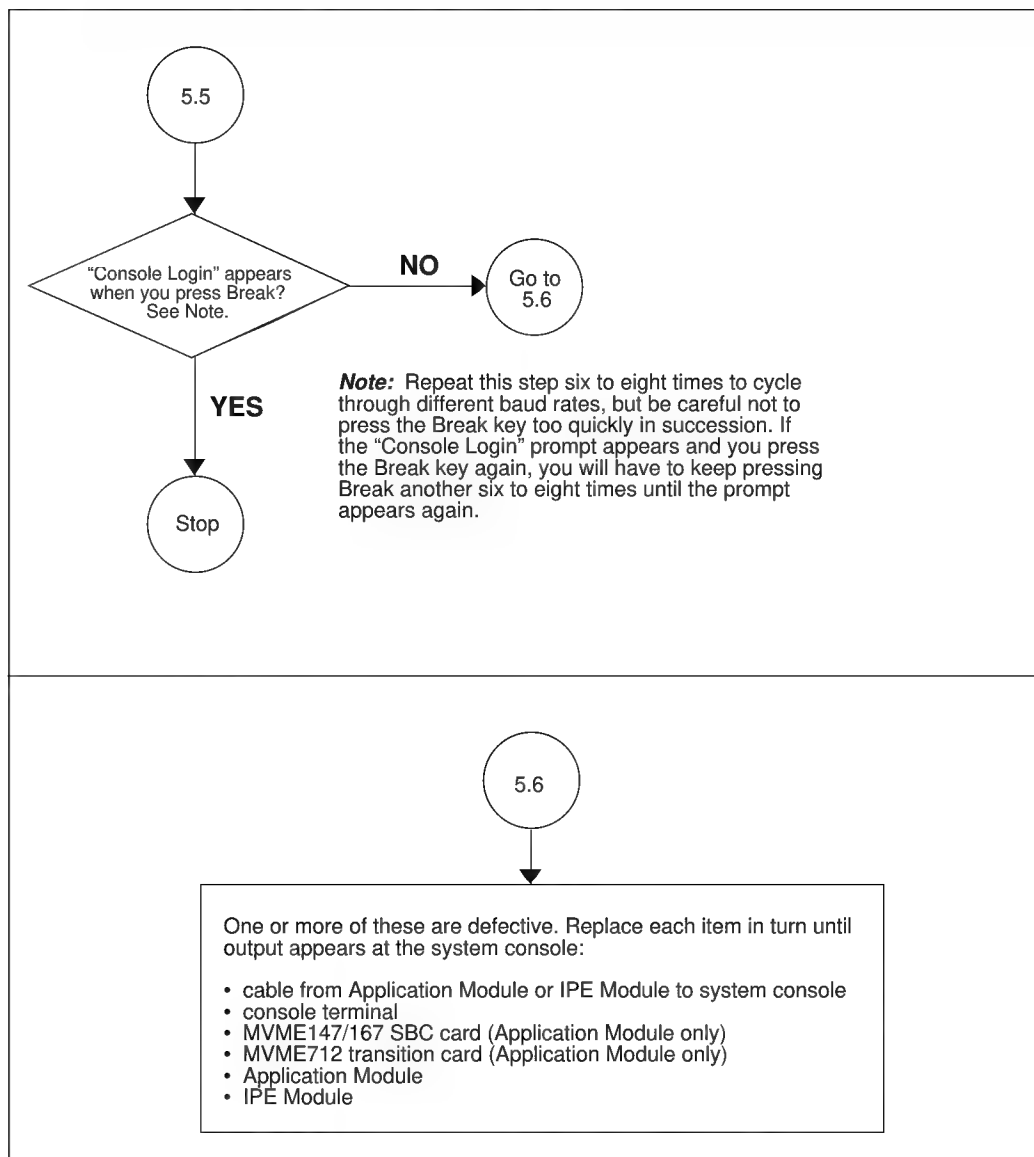


Diagnostic procedure 5
System console fault suspected (continued)



Diagnostic procedure 5

System console fault suspected (continued)



Diagnostic procedure 6: System start-up problem

Typical start-up messages are listed here, along with points at which a problem could occur. To see the start-up messages, restart the Application Module or IPE Module using Procedure 2: SBC restart.

N The illustrations in this section are for the Application Module
M MVME167 card or IPE Module. The Application Module MVME147
m messages are similar.
e
:

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 MVME167 Debugger/Diagnostics Release Version 1.4 - 07/22/92

If the system stops at the previous prompt and there is no response at your system console, contact your service representative to have your system reset.

```
COLD Start
Local memory Found = D0800000 (&-8388608)
MPU Clock Speed = 25 Mhz
```

After this point, a series of diagnostic tests is performed on system components. If the system hangs or displays a FAILED message at a particular test, note the name of the test where the problem occurred and contact your service representative.

When the testing ends, the system automatically boots.

```
Autoboot in progress... To abort hit <BREAK>

RAM address from VMEbus = $00000000

Booting from: VME167, Controller 0, Device 0
```

If “Loading: Operating System” is not displayed, UNIX was probably not installed correctly. If it is determined that UNIX was not installed correctly, go to “Software reinstallation” for installation instructions.

Loading: Operating System

If “Loading: Operating System” is the last message displayed and the system seems to be frozen, the SCSI bus may need to be reset. Perform Procedure 2: SBC restart, and type **h** while the firmware tests are being run. At the “167-Diag” or “4120-Diag” prompt, type **reset** and press [Return]. Answer **y** to the first prompt, **c** to the second prompt, and **n** to the third prompt.

```
Volume:
IPL loaded at:  $001F0000
MVME TAPE IPL Version 1.0

*****
                System V/68 Release R3V7 M68030 Version 920526

                Real mem  = 6291456
                Avail mem = 4964352
                Buffers   = 60

*****
        Copyright (c) 1984-1992 Motorola Inc. All rights reserved

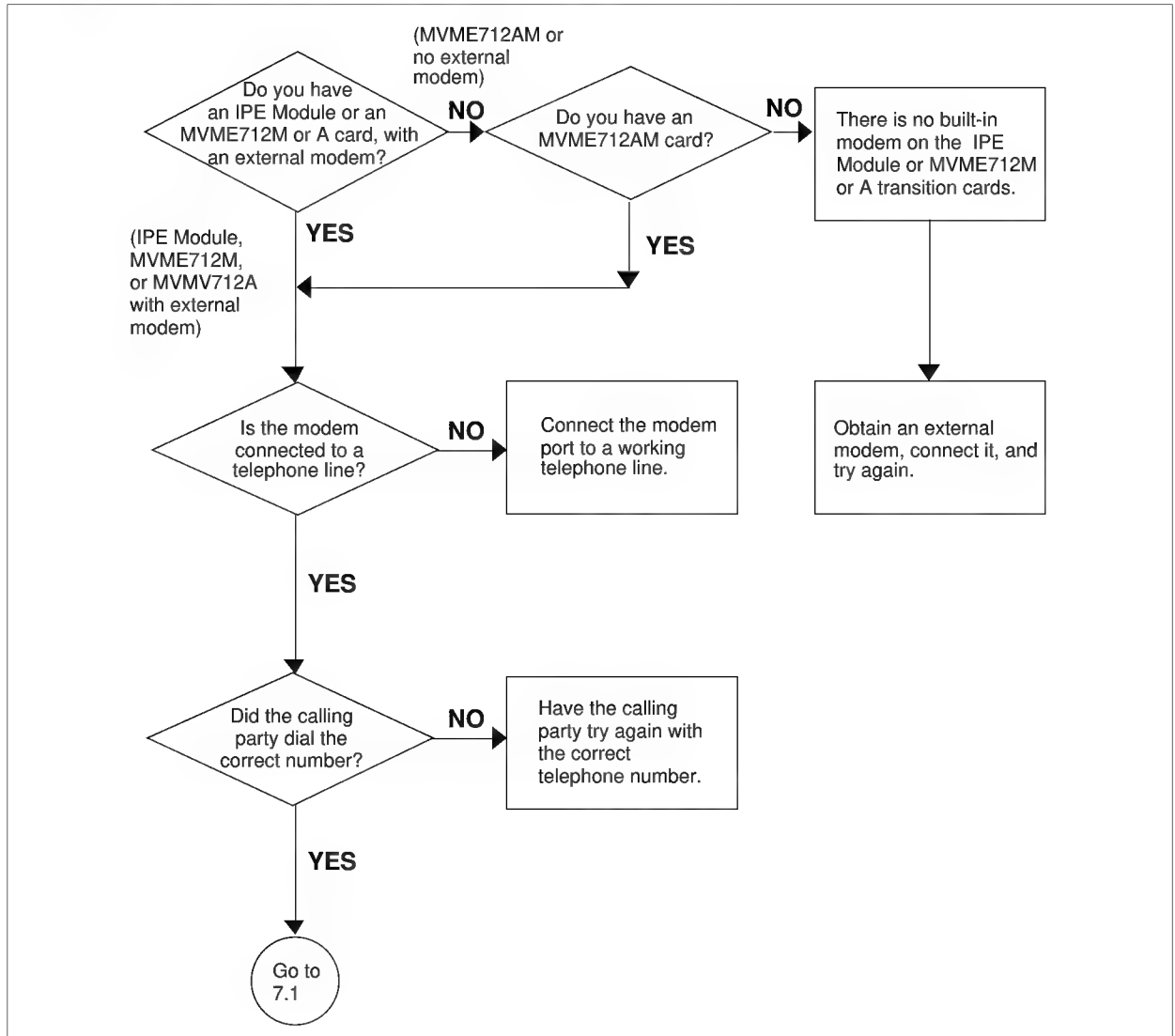
Init: Single User Mode
erase = #  kill = @  intr = DEL  quit = ^|
***
Enter <CR> to pause in a single user shell before init.
```

The system issues a series of messages as it starts up. When start-up is complete, the system displays the “Console Login:” prompt.

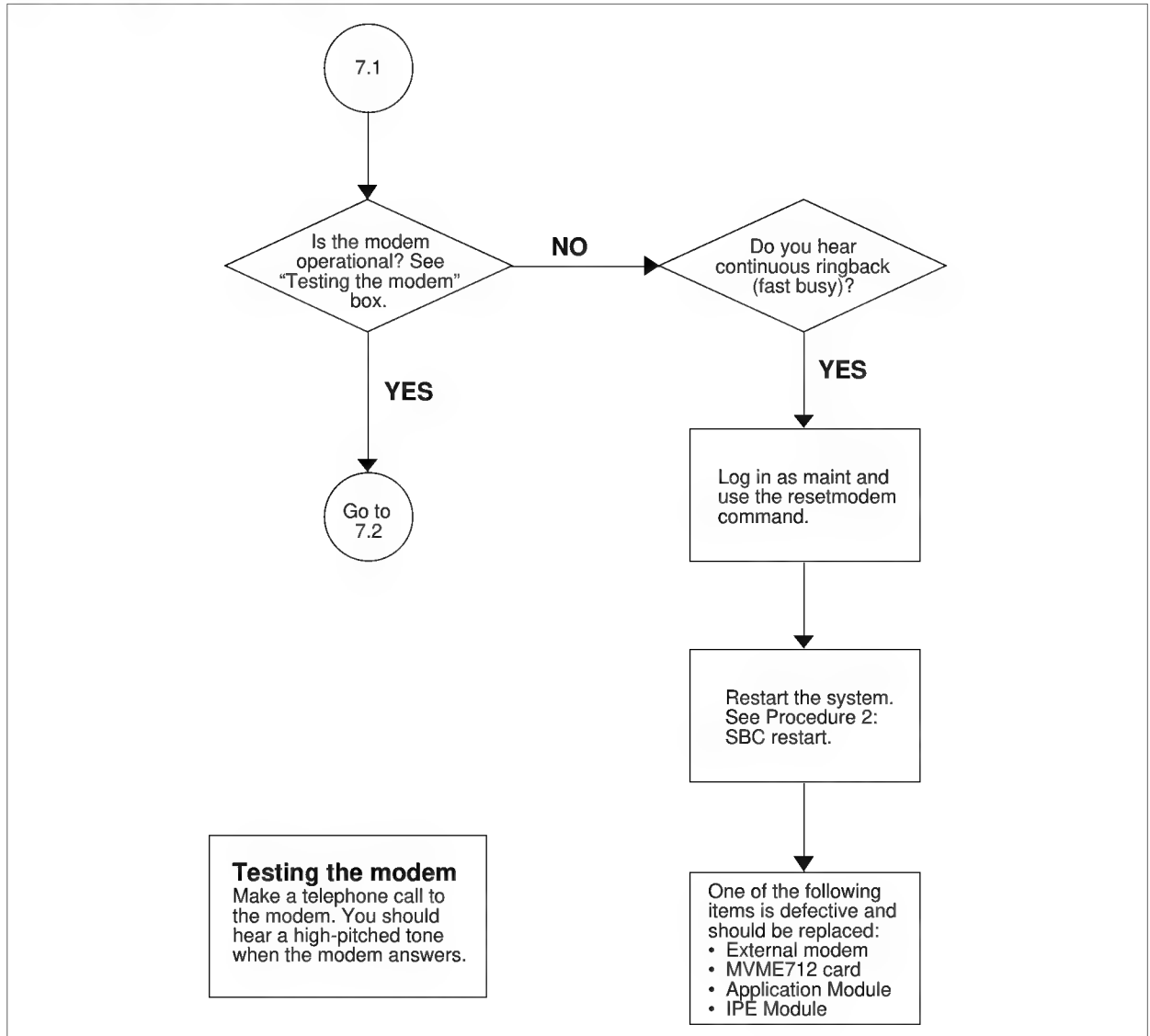
Check for the following problem indicators during system start-up:

- Fail (red) LED on the Application Module MVME147/167 card remains lit after system start-up is completed—replace the MVME147/167 card and reboot
- Fail (red) LED on the IPE Module remains lit after system start-up is completed—replace the IPE Module, reload the software and reboot
- System Panic message appears—the UNIX operating system may be in trouble. This may require special technical assistance. Restart the system. If the error persists, you may have to perform a reinstallation.
- SCSI I/O errors appear—the errors can look like the following: Timeout on nnnnn SCSI device, where nnnnn is the device name (such as CPU card, tape drive, or hard disk). If they appear, check that the disk/tape unit is inserted properly.
- Physical Block errors appear—the errors can look like the following:
Physical Block: 0xDE0 (11744) Command Byte:74 Status Byte
1:24 (the numbers may be different). If this occurs, the hard disk is probably faulty and should be replaced.

Diagnostic procedure 7: Dial-up problem

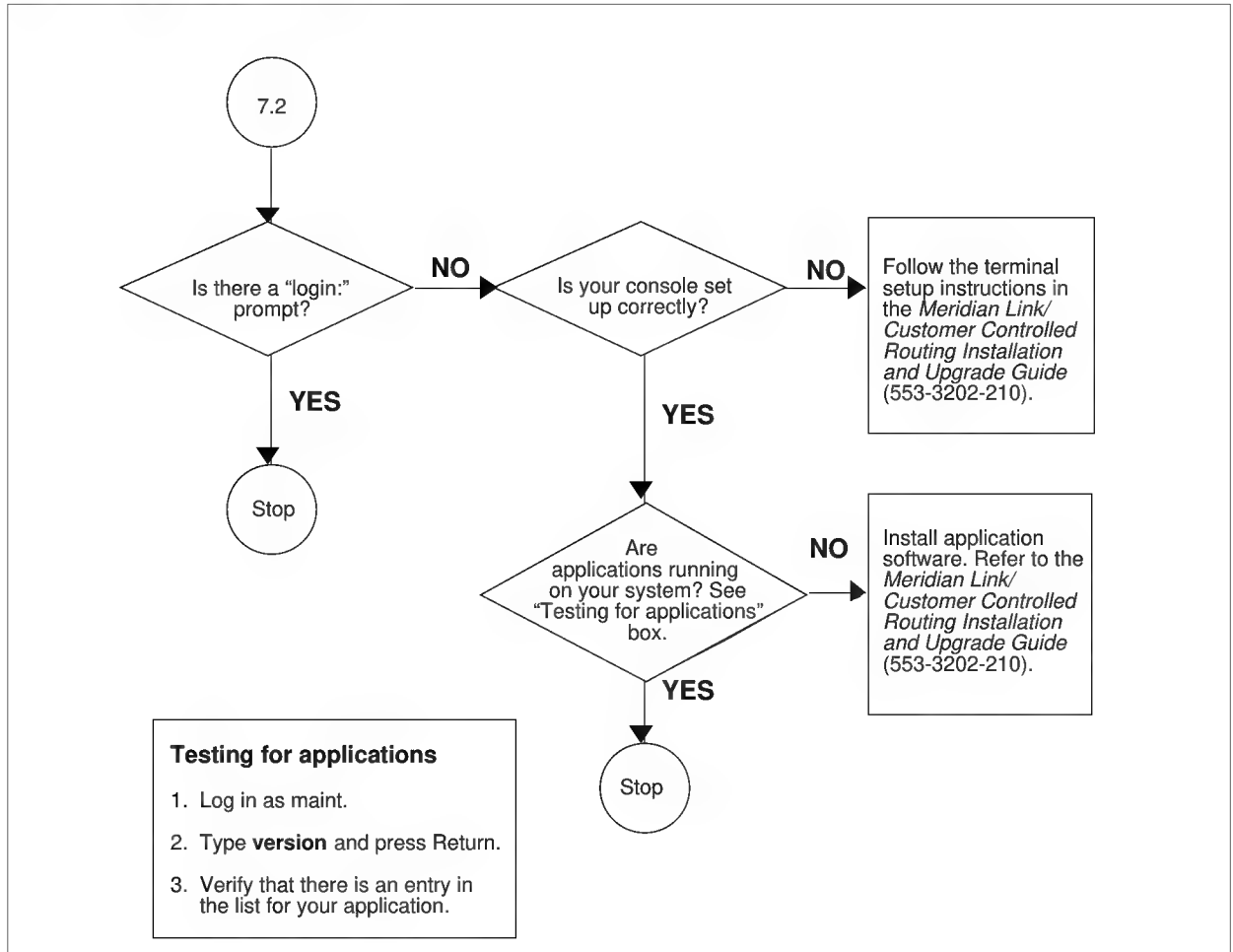


Diagnostic procedure 7
Dial-up problem (continued)



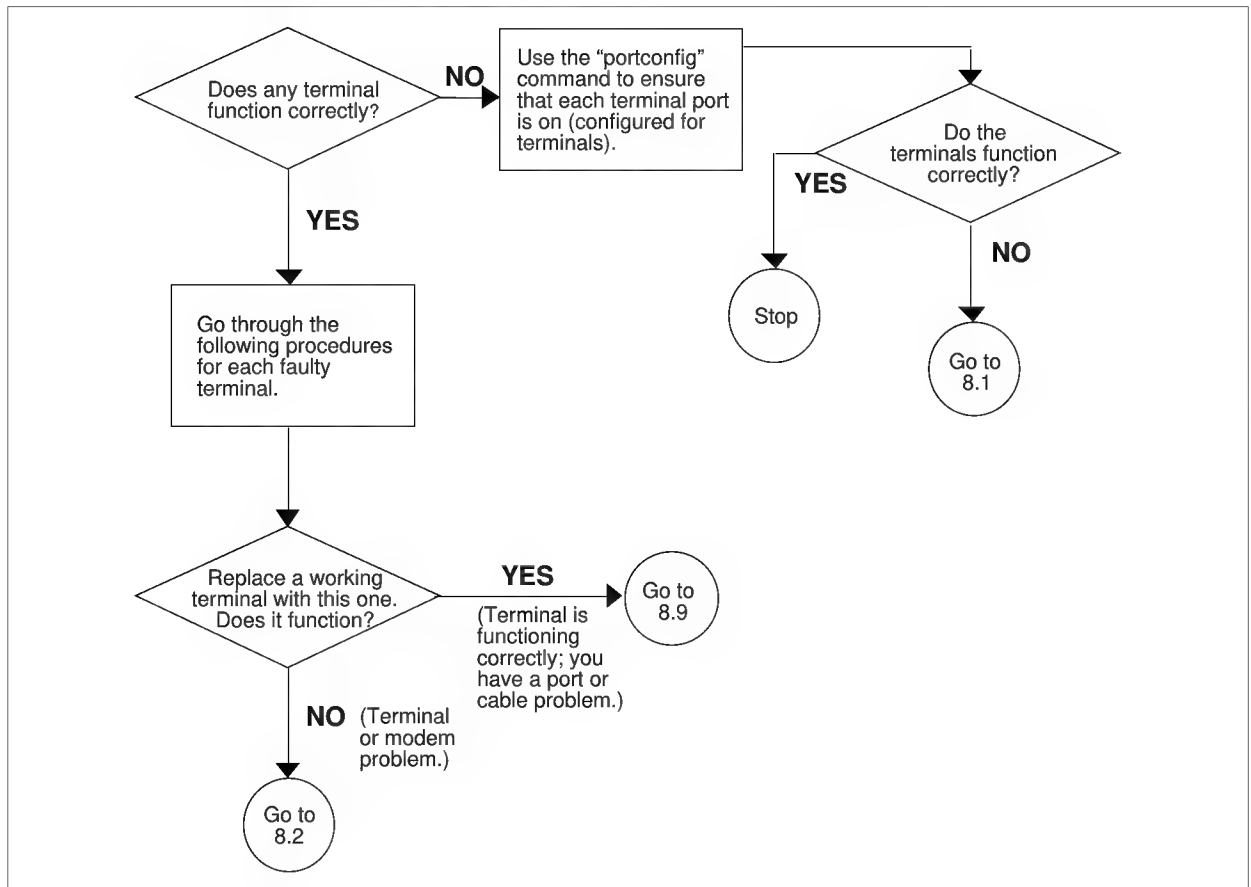
Diagnostic procedure 7

Dial-up problem (continued)



Diagnostic procedure 8: Application terminal problem

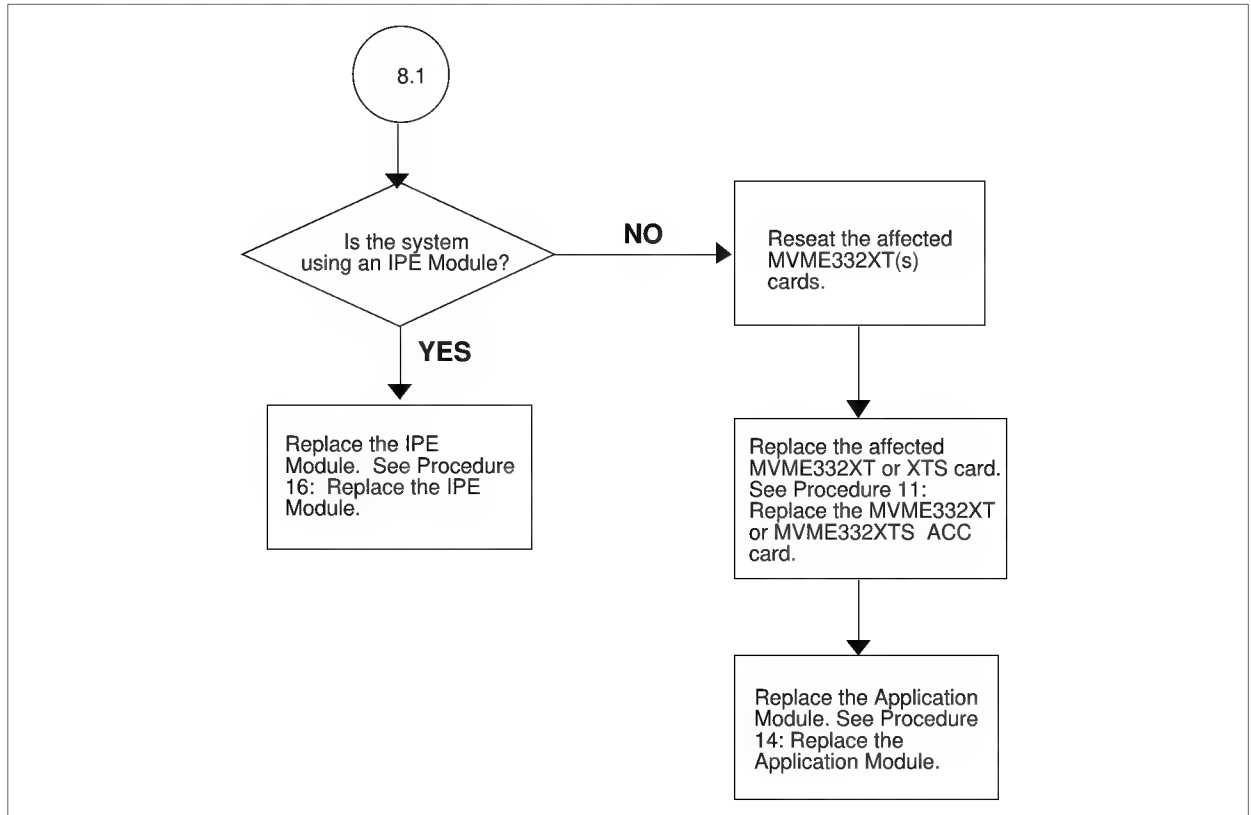
This procedure applies to CCR only.



Diagnostic procedure 8

Application terminal problem (continued)

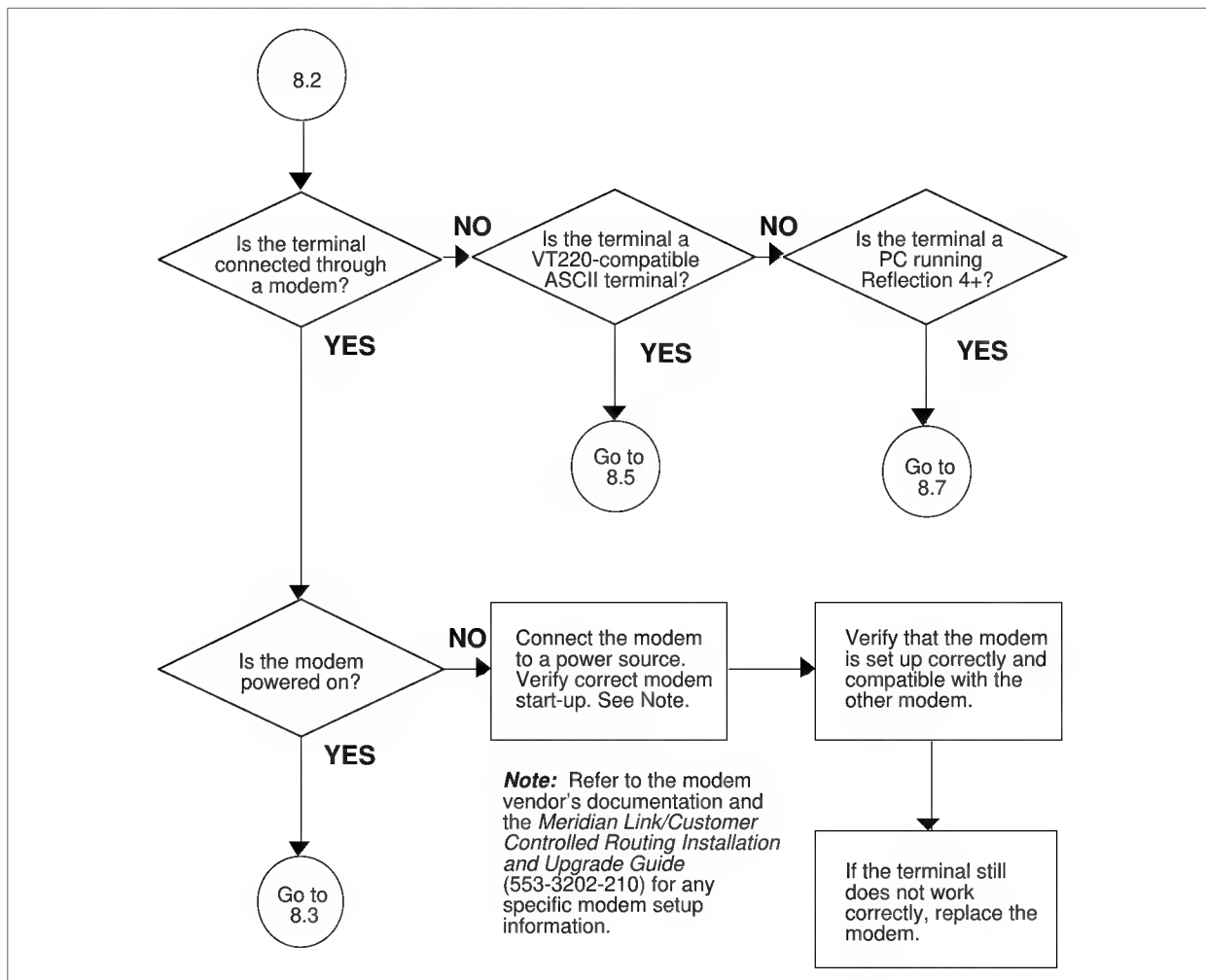
This procedure applies to CCR only.



Diagnostic procedure 8

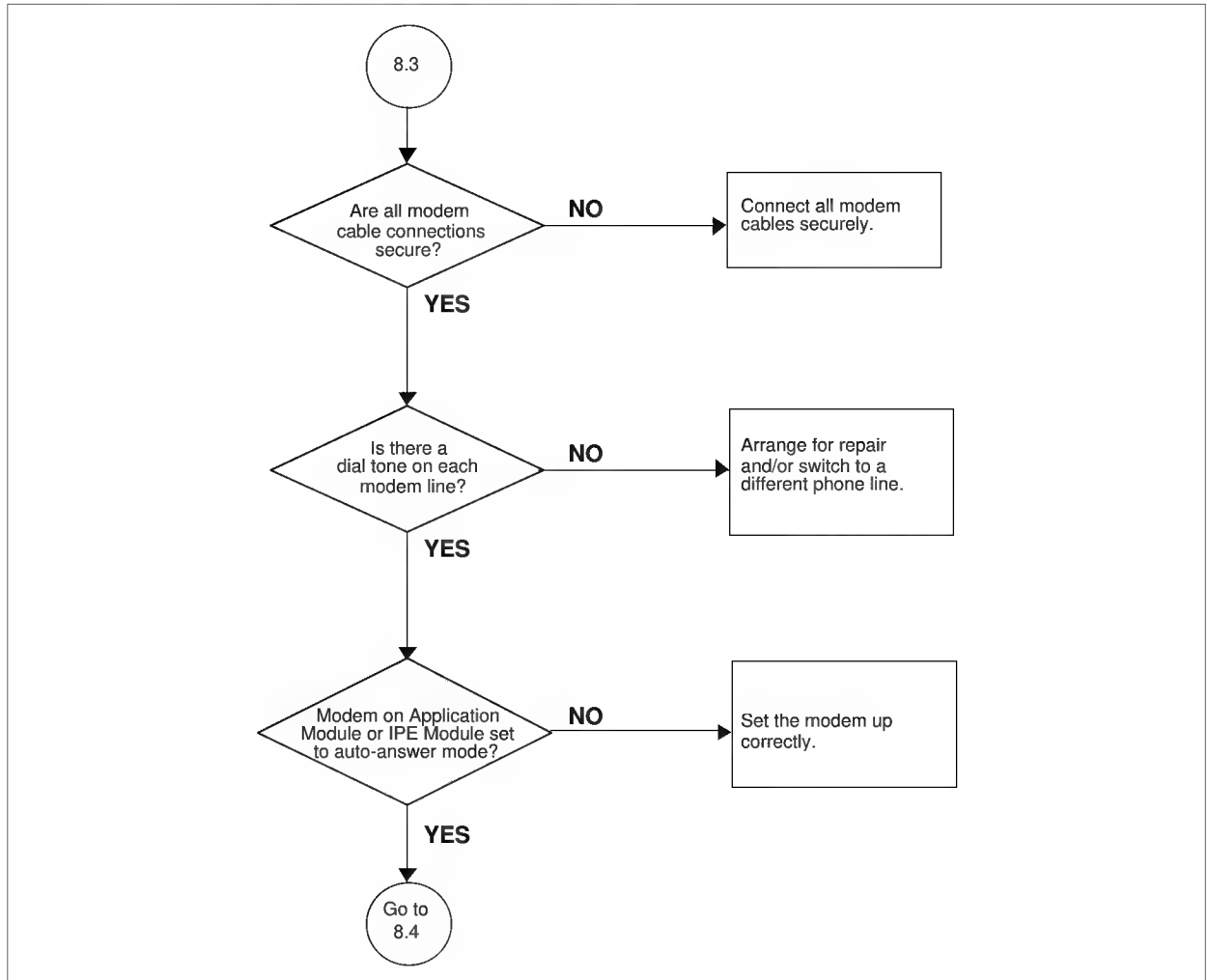
Application terminal problem (continued)

This procedure applies to CCR only.

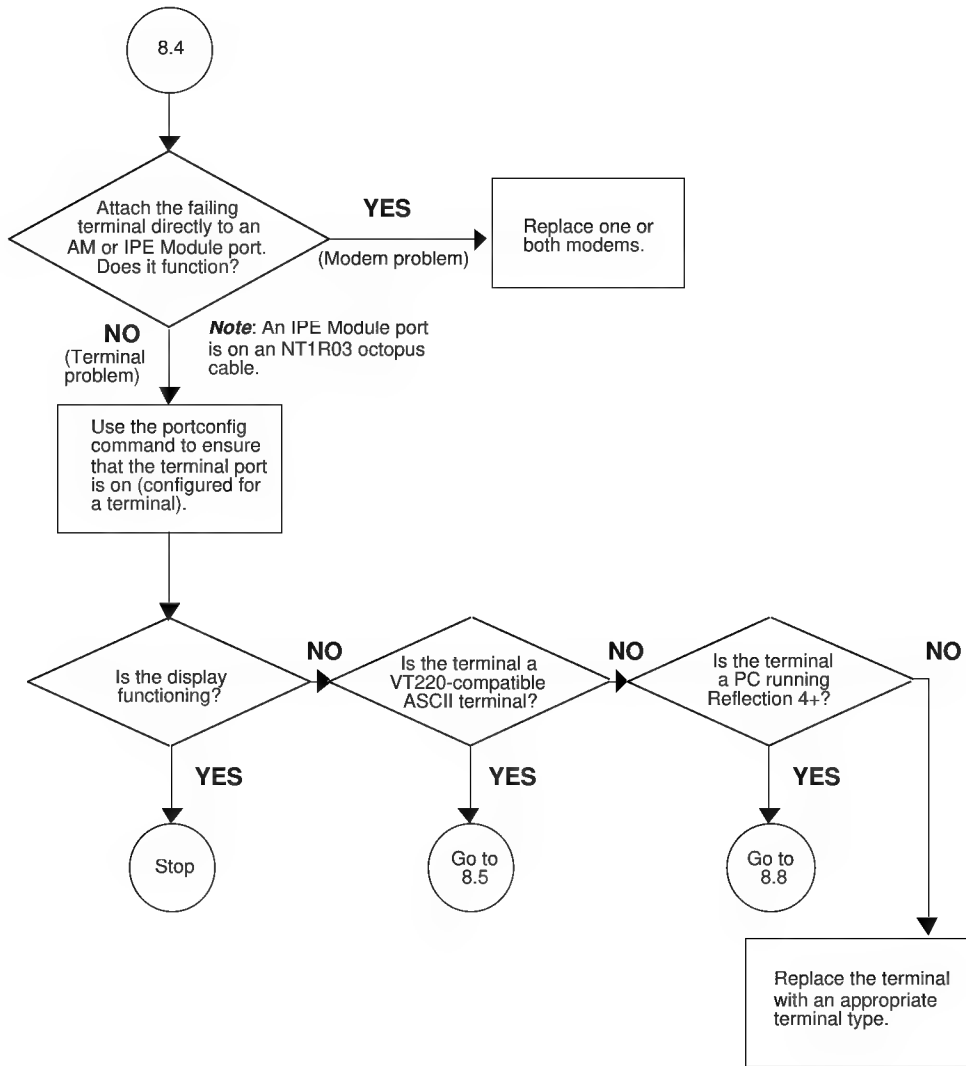


Diagnostic procedure 8
Application terminal problem (continued)

This procedure applies to CCR only.

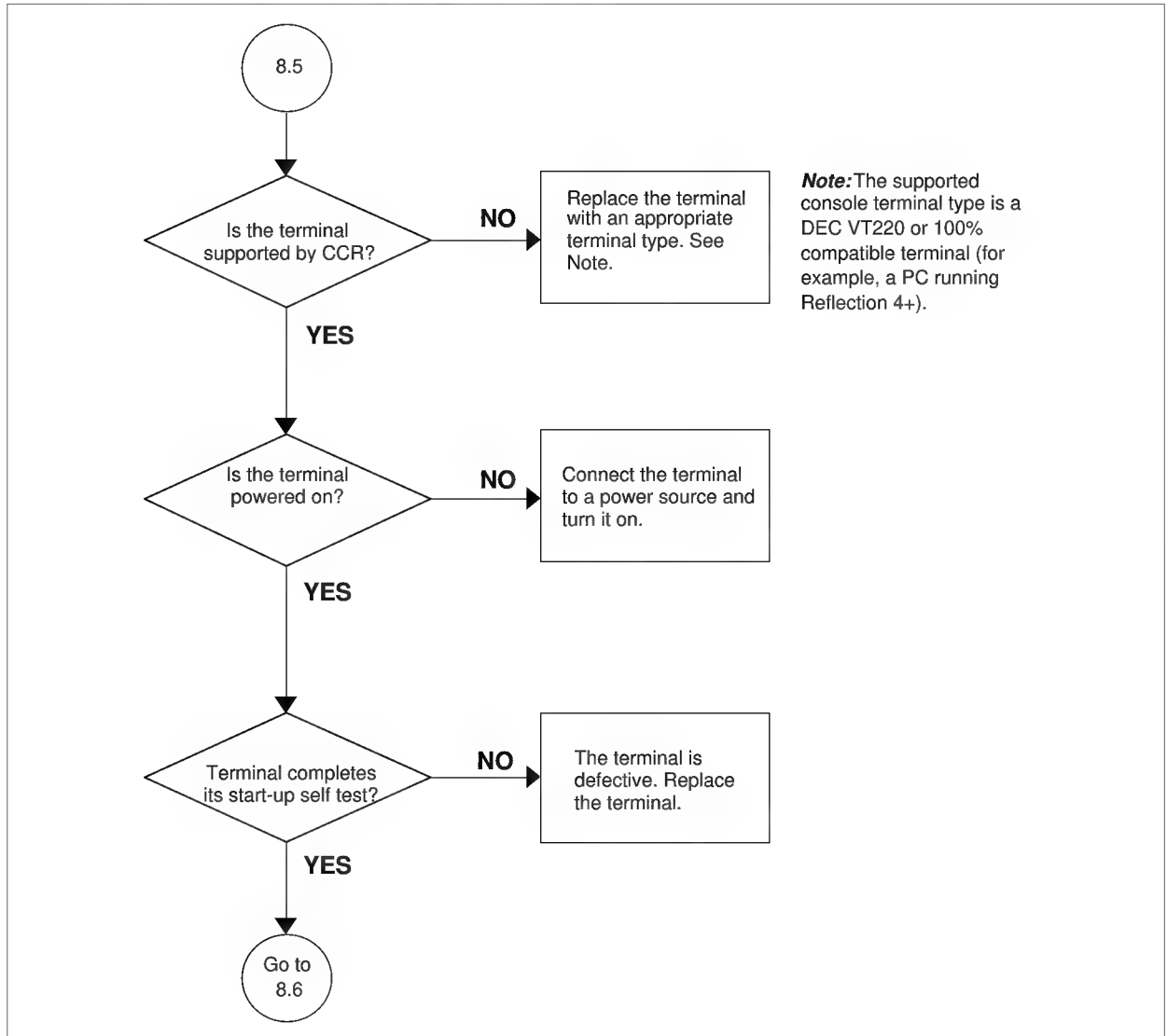
**Diagnostic procedure 8**
Application terminal problem (continued)

This procedure applies to CCR only.



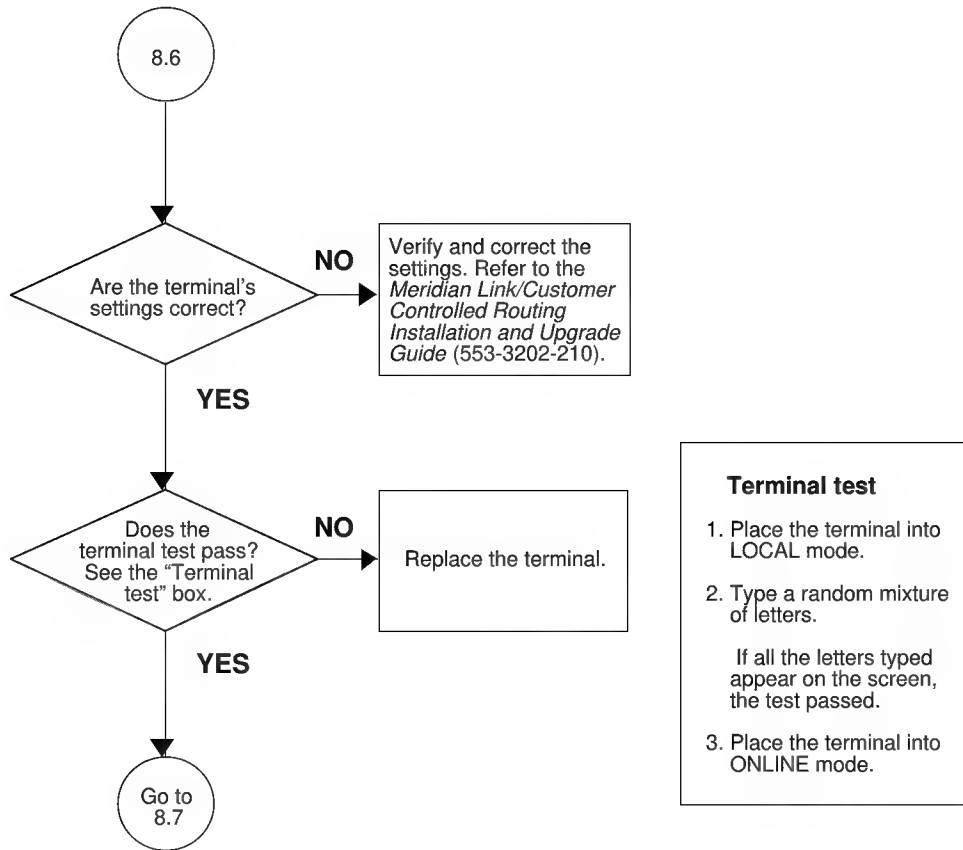
Diagnostic procedure 8
Application terminal problem (continued)

This procedure applies to CCR only.



Diagnostic procedure 8
Application terminal problem (continued)

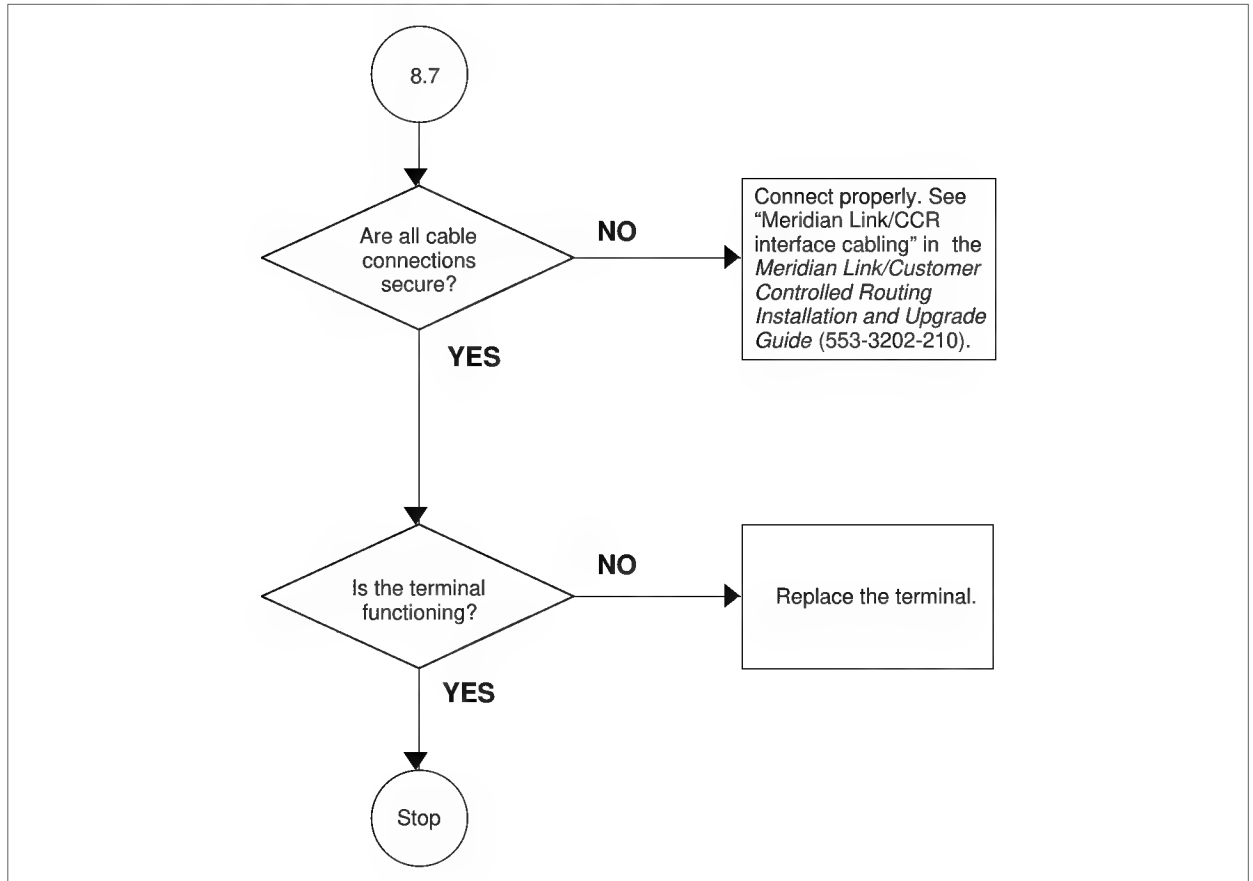
This procedure applies to CCR only.



Diagnostic procedure 8

Application terminal problem (continued)

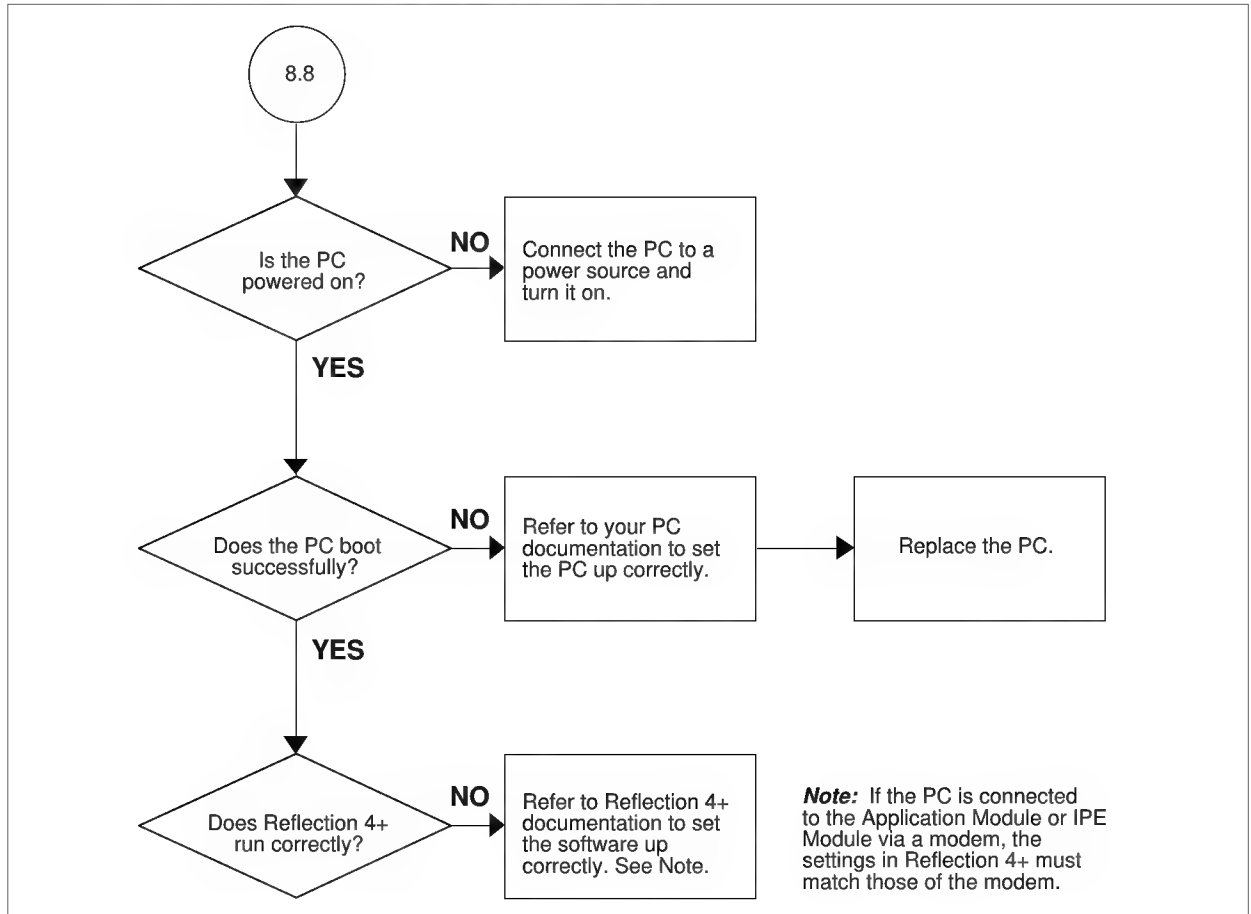
This procedure applies to CCR only.



Diagnostic procedure 8

Application terminal problem (continued)

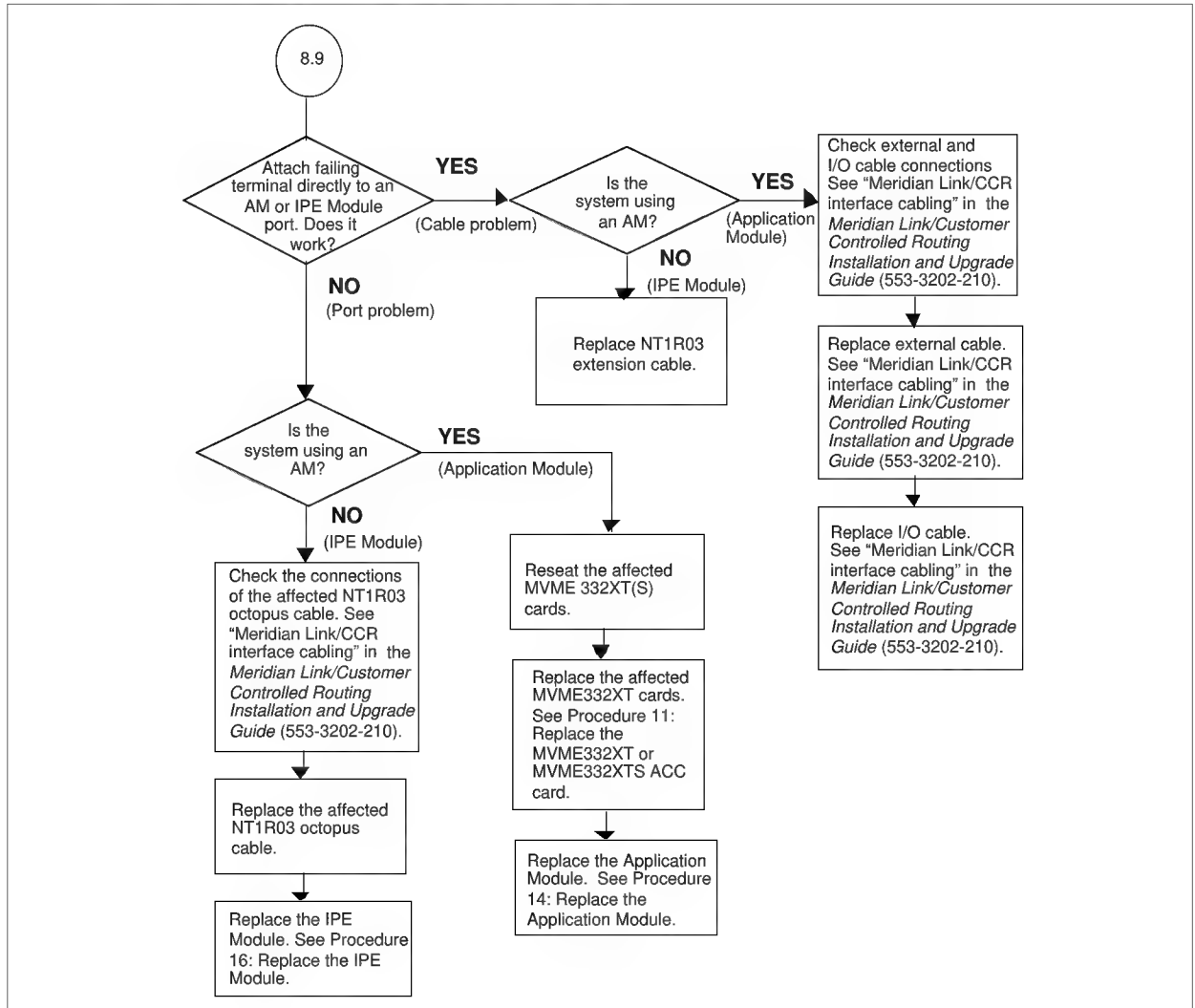
This procedure applies to CCR only.



Diagnostic procedure 8

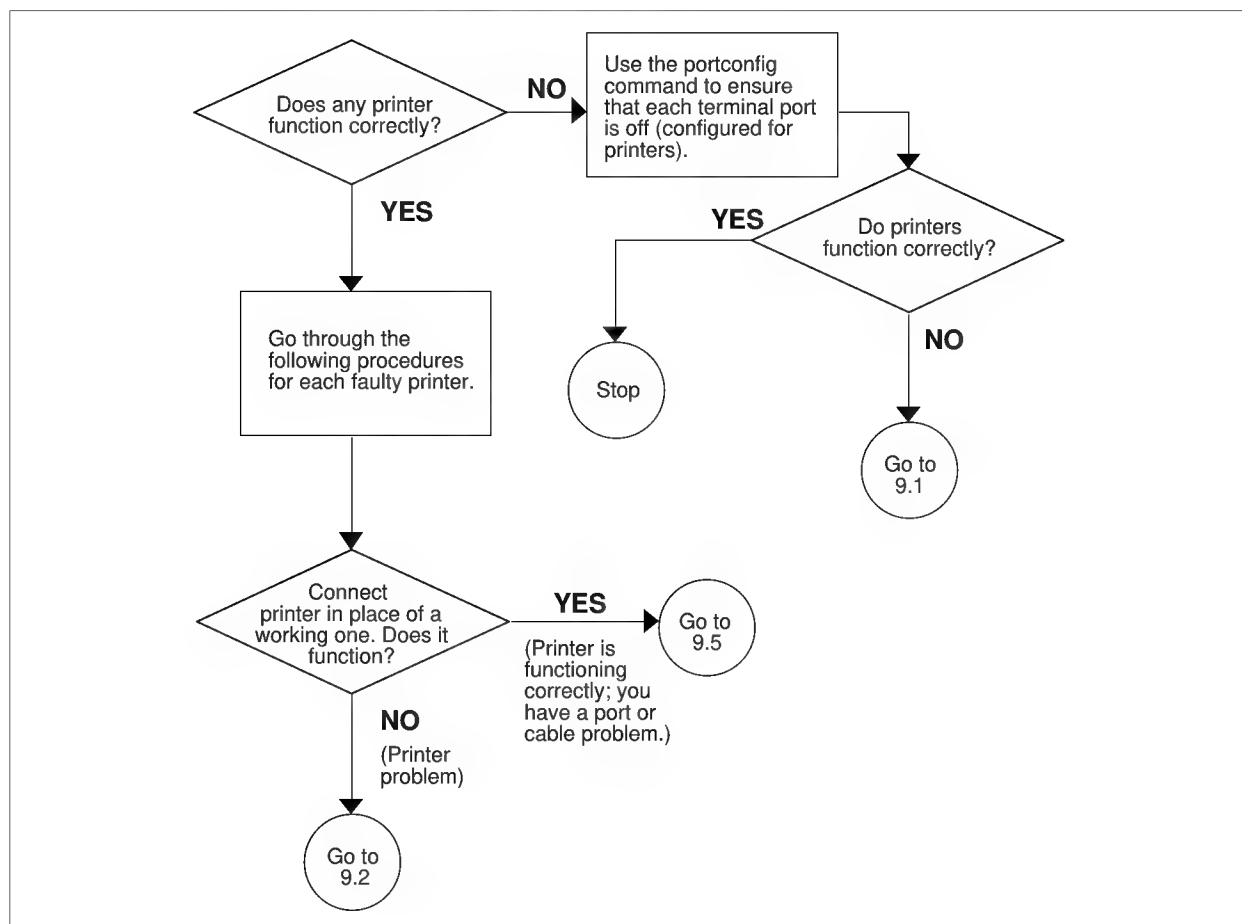
Application terminal problem (continued)

This procedure applies to CCR only.



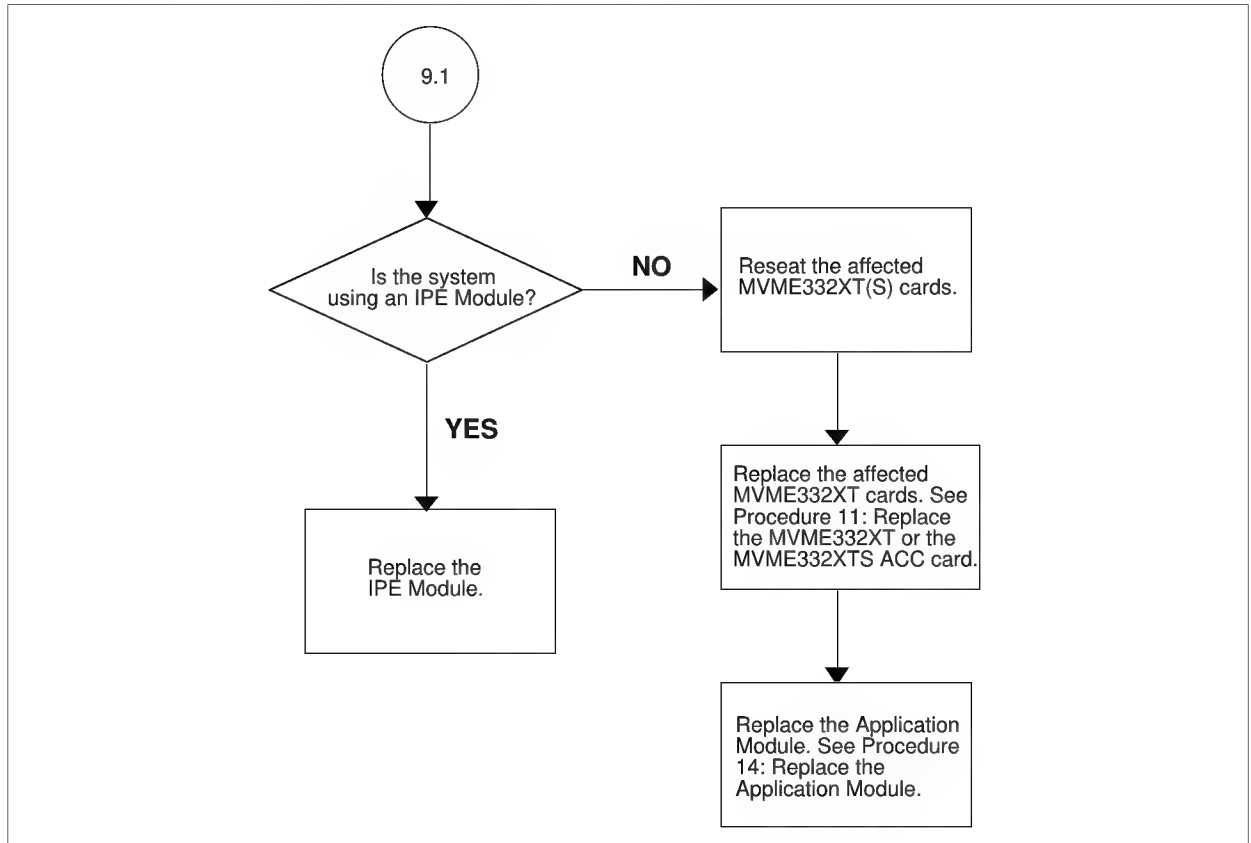
Diagnostic procedure 9: Printer faults

This procedure applies to CCR only.



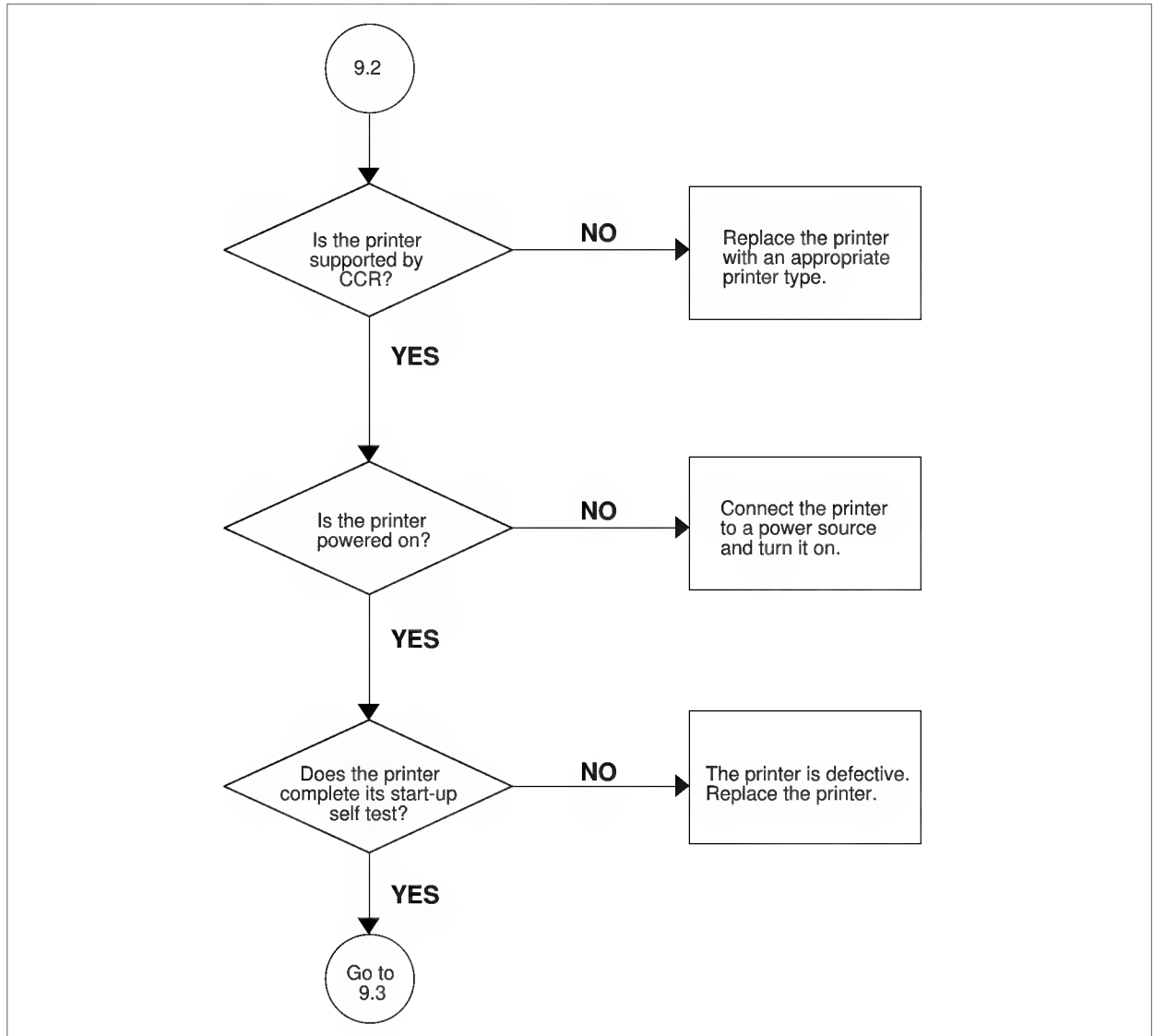
Diagnostic procedure 9
Printer faults (continued)

This procedure applies to CCR only.



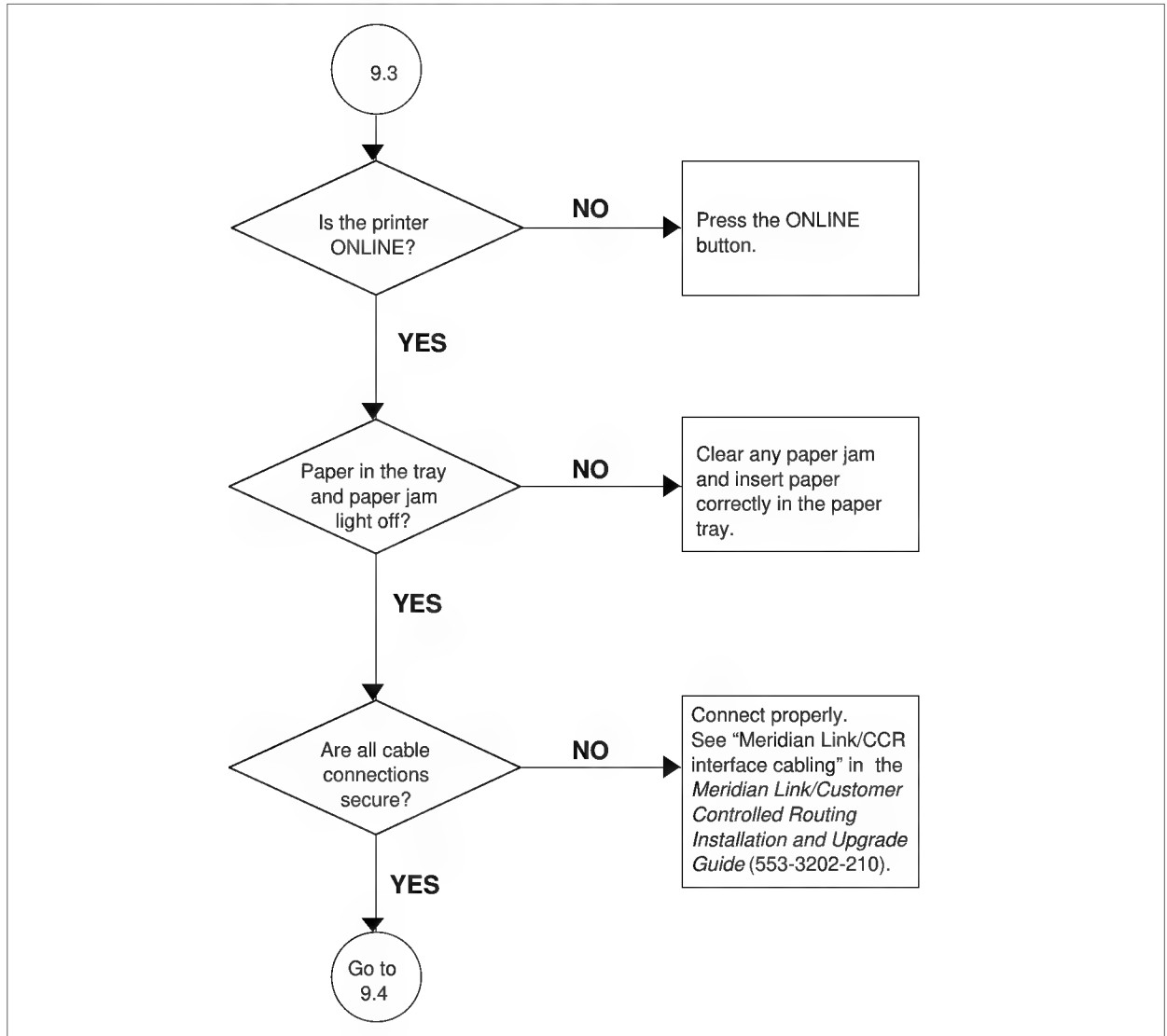
Diagnostic procedure 9
Printer faults (continued)

This procedure applies to CCR only.



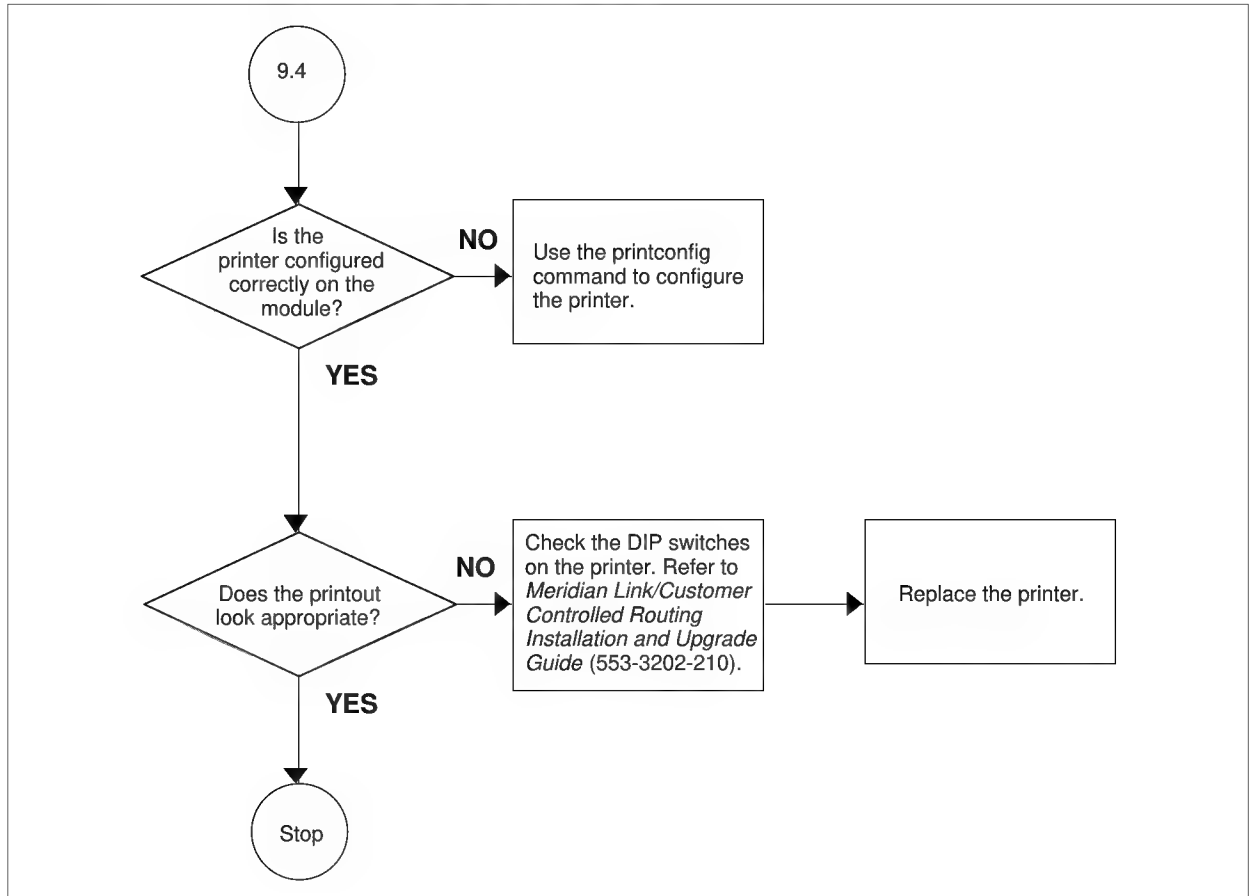
Diagnostic procedure 9
Printer faults (continued)

This procedure applies to CCR only.



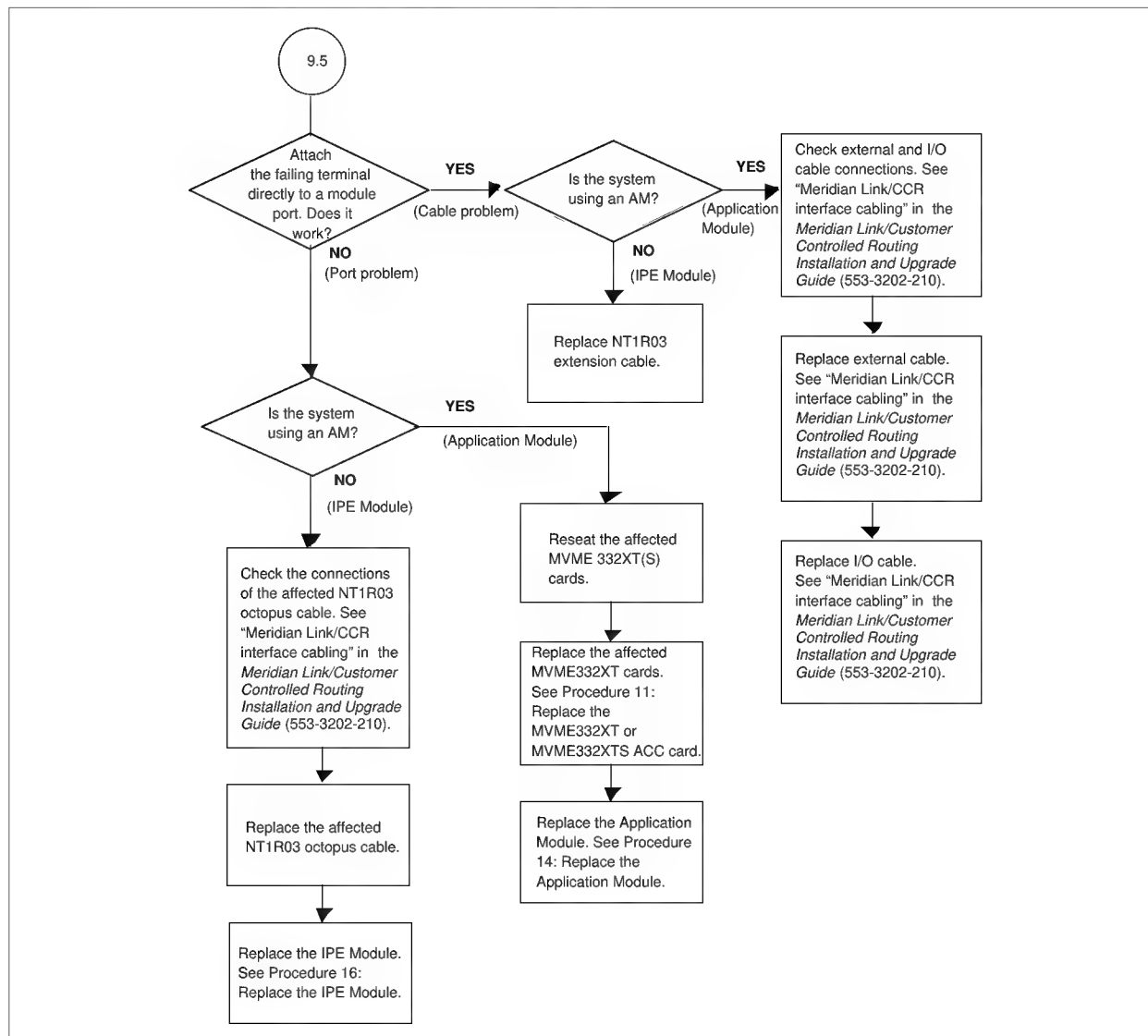
Diagnostic procedure 9 Printer faults (continued)

This procedure applies to CCR only.



Diagnostic procedure 9 Printer faults (continued)

This procedure applies to CCR only.



Disk/tape drive unit faults

Hard disk drive read/write fault

If the following error message appears repeatedly on the system console, the hard disk drive is defective and needs to be replaced:

page read error on integral hard disk #, partition #

To replace the IPE Module hard disk, you must replace the IPE Module. The following procedures are detailed in Chapter 8, "Recovery/replacement procedures."

- Procedure 15 to remove the IPE Module
- Procedure 16 to replace the IPE Module
- Procedures 20–22 to load the software.
- Procedure 24 to restore the files from the backup tape

To replace the Application Module disk/tape unit, perform the following:

- Procedure 6 to remove and replace the disk/tape unit
- Procedure 19 or 20 to load BOS
- Procedure 21 and 22 to reboot the system and load the applications
- Procedure 24 to restore files from the backup tape

Technical diagnostic tests are available to some users, as described in the *Application Module and Intelligent Peripheral Equipment Module Advanced Maintenance Guide* (NTP 553-3211-512).

Tape drive read/write fault

If you cannot write to the tape drive, do the following:

- Ensure that the tape is not write protected.
- Ensure that the tape has been inserted correctly into the tape drive and the door is completely closed.

Technical diagnostic tests are available to some users, as described in the *Application Module and Intelligent Peripheral Equipment Module Advanced Maintenance Guide* (NTP 553-3211-512).

Login failure

Once UNIX has booted, you can log in with one of the login IDs described in Chapter 1, “Overview.” The following example shows how to log in by entering the desired login ID at the UNIX login prompt. The default password for each login ID is the same as the login ID. For example:

Console Login: **maint**

Password: **maint**

```
N      The password is not displayed on the console.
o
t
e
:
```

If you cannot log in from an Ethernet LAN-based PC, Ethernet LAN support may not be enabled. If Ethernet LAN support is already enabled, use the startNSE command to activate the support. Use Procedure 25 to enable Ethernet LAN support if it is not enabled.

Difficulty logging in as ccusr

This section applies to CCR only.

Log in as ccusr. If the login is successful, the “Enter User ID” prompt appears.

- If logging in as ccusr results in the following message:

```
CCR Application is not running. Cannot log in now.
Please start the application and try again.
```

Start the CCR application software by logging into maint and entering the ccrstart command:

```
maint> ccrstart
```

The following display appears:

```
Starting CCR Application...
Starting Customer Controlled Routing Processes...
```

```
maint>
```

- If performing a login as ccusr results in a “Login incorrect” message, verify that the password is correct. The default password for ccusr is ccusr. Also make sure that, if the password is in lowercase, CAPS LOCK is not set.
- If you are able to enter the login ID and password successfully but do not get the “ccusr>” prompt, or if you are unable to enter input at the prompt, verify that the console setup is correct. See *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210) for more information on console setup.
- If a login as ccusr is still unsuccessful or the applstart command is not successfully executed (the above example shows a successful start-up), restart the Application Module or IPE Module by powering down safely (using the powerdown command in maint) and pressing the red RESET button on the front of the SBC card (Application Module) or on the faceplate (IPE Module).

```
N      If the Application Module is configured to automatically start
the CCR application, it is not necessary to manually start CCR after
the Application Module has restarted. Log in as maint and enter the
following command to determine if CCR is configured to
:
```

automatically start:

`maint> bootconfig`

- If you still cannot log in as `ccusr`, contact your Nortel support personnel.

Difficulty logging in as `maint`

If the login is successful, the “`maint>`” prompt appears.

- If logging in as `maint` results in a “Login incorrect” message, verify that the password is correct. The default password for `maint` is `maint`. Also make sure that, if the password is in lowercase, **CAPS LOCK** is not set.
- If you are able to enter the login ID and password successfully but do not get the “`maint>`” prompt, or if you are unable to enter input at the prompt, verify that the console setup is correct. Refer to “Diagnostic procedure 5: System console fault suspected” earlier in this chapter.
- If you still cannot log in as `maint`, reinstall the application software as described in Chapter 8, “Recovery/replacement procedures.”

Difficulty logging in as mlusr

You can login to mlusr at the “Console login:” prompt or by using the mlusr command from maint.

If the login is successful and the “mlusr>” prompt appears, the system is ready to accept additional commands.

- If logging in as mlusr results in the following message

“application” software not responding.
Administration tool unable to register.
Is “application” software installed and running?
Login as maint, and execute mlstart.
Goodbye...

in which “application” represents the name of the application, power down the Application Module and reboot.

- If logging in as mlusr results in a “Login incorrect” message, verify that the password is correct. The default password for mlusr is mlusr. Also make sure that, if the password is in lowercase, CAPS LOCK is not set.
- If you are able to enter the login ID and password successfully but do not get the “mlusr>” prompt, or if you are unable to enter input at the prompt, verify that the console setup is correct. Refer to the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210).
- If logging into mlusr is still unsuccessful, restart the Application Module by logging into maint and using the powerdown command. When the “System secured for powering down” message appears, press the red RESET button on the IPE Module faceplate or Application Module SBC card.

After the Application Module has rebooted, start the application.

- If you still cannot log in as mlusr, reinstall the application software as described in Chapter 8, “Recovery/replacement procedures.”

Link failure

The Application Module or IPE Module supports three links:

- Link 0, an LAPB link to the Meridian 1 (AML)
- Link 1, an X.25 or a TCP/IP link to a host computer (Meridian Link only)
- Link 2, an asynchronous link to Meridian Mail (optional for Meridian Link only)

If any or all of these links fail, the application cannot operate normally.

AML (Link 0) will not establish

If the AML, which connects an ESDI or MSDL port on the Meridian 1 to a port on the Application Module, does not come up, follow these steps:

1 Check the link status from the Application Module.

- a Log in as mlusr or log in as maint and use the mlusr command.
- b Check the status of the link.

```
mlusr> status link 0
```

If the response is “Link 0 : Up”, the AML is properly connected.

If the response is “Link 0 : Disabled”, enable the link.

```
mlusr> enable link 0
```

If the response is “Link 0 : Enabled but down”, the AML is properly enabled but has not established a LAPB connection with the Meridian 1 ESDI or MSDL port. Try to establish the link from the Meridian 1 (go to step 2 for X11 Release 17/X11 International Phase 7 or earlier software; go to step 3 for X11 Release 18 or later software).

- c Check the system log file for errors by logging in as mlusr and using the viewlog command.

- 2 For X11 Release 17/X11 International Phase 7 or earlier software only—check link status from the Meridian 1. Refer to *X11 Input/Output Guide* (NTP 553-3001-400) for more information, if necessary.

Example: Link is attached to ESDI port 8

Substitute the port number in your configuration for the digit 8 in this example.

- Type **LD48** for link maintenance commands and press [Return].

> **LD 48**

- Check the status of the link.

.STAT ESDI

If the response is “ESDI #08 : CONNECTED (SYNC CMS)”, the AML is properly connected.

If the response is “ESDI #08 : ENABLED (SYNC CMS)”, the AML is properly enabled, but it is not connected.

If the response is “ESDI #08 : DISABLED (SYNC CMS)”, enable the ESDI port. The ACMS command will put the ESDI port in auto recovery mode. That is, if the AML goes down, the

Meridian 1 will automatically try to enable it. Enter the following:

.ACMS 8

If the response is “ESDI #08 : AUTO SETUP (SYNC CMS)”, the AML is already in auto recovery mode. No action is necessary.

- If the message “CSA003 8 t” is reported on the Meridian 1 console, the AML connection is established at system time t.
- If the message “CSA001 8 t 8” is reported on the Meridian 1 console, the AML LAPB connection is not established at system time t. Check the hardware and software configurations of the ESDI port.

- 3 For X11 Release 18 or later software only—check link status from the Meridian 1. Refer to *X11 Input/Output Guide* (NTP 553-3001-400) for more information, if necessary.

Example: Link is attached to ESDI or MSDL port 8

Substitute the port number in your configuration for the digit 8 in this example.

- Type **LD48** at the Meridian 1 console and press [Return].
 > **LD 48**
- Check the status of the link.

.STAT AML 8

If LXR2 status is EST (established), the AML is properly connected.

If LXR2 status is DSBL (disabled), enable the AML as follows:

- If you have an ESDI card, type **ENL AML 8 ACMS** (replace 8 with the appropriate port number for your configuration) and press [Return].
 - If you have an MSDL card, type **ENL AML 8** (replace 8 with the appropriate port number for your configuration) and press [Return]. If you do not have AUTO RECOVERY on, you must also type **ENL AML 8 LXR7** (replace 8 with the appropriate port number for your configuration) and press [Return].
- 4 Check the following:
- If you are using QPC513 ESDI, ensure that it is vintage G (or later).
 - Ensure that the cable from ESDI or MSDL port (on the Meridian 1 I/O panel) to the Application Module (NT7D58) is properly mated.

5 Check the link 0 configuration on the Meridian 1.

- Link 0 must be configured as DTE. The software Physical DTE must be set to 0 for DTE configuration.
- The link speed must be 19200 bps.
- For DTE configuration, the internal address (IADR) must be 1, and remote address (RADR) must be 3.

mlusr> **display link 0**

The following display appears (the pertinent values of the Link 0 configuration are underlined):

Protocol: HDLC	Link type: 1
Machine ID: hdlcdest	
Delay: 0	
Port type: H	<u>Physical DTE(0)/DCE(1): 0</u>
PDN type: 0	Maximum Frame length: 135
<u>Baud rate: 19200</u>	Fail timer: 50
RFS timer: 150	<u>Internal address: 1</u>
<u>Remote address: 3</u>	T1: 20
Maximum out frames (K): 7	Maximum trans attempts (N2): 8

- If the display link configuration parameters are not the same as the above example, the parameters need to be changed using the change link 0 command (see Chapter 3, “Link maintenance commands”).

6 Confirm that the application software package is installed on the Meridian 1.

- Type **LD22** at the Meridian 1 console, and press [Return].
- At the REQ prompt, type **PRT** and press [Return].
- At the TYPE prompt, type **PKG** and press [Return]. A list of all software packages installed on the Meridian 1 will be displayed.
- Ensure that the list includes entries for the software packages.

If the required packages are not listed, contact your Nortel support personnel.

7 Confirm the Meridian 1 Machine ID (system ID).

- Type **LD22** at the Meridian 1 console, and press [Return].
- At the REQ prompt, type **TID** and press [Return]. Information similar to the following is displayed:
 TAPE ID:
 LOADED xxxx
 DISK/TAPE xxxx

 Your Meridian 1 machine ID, a string of up to eight characters, appears in place of the "xxxx".
- Log in as **maint** on the Application Module, and use the showid command (as described in Chapter 2, "Application Module commands").

If the Meridian 1 machine (system ID) does not match the machine ID given in response to the showid command, the AML cannot function. Contact your Nortel support personnel for the correct Application Module software.

8 Check ESDI or MSDL port configuration on the Meridian 1.

There are several parameters that must be configured correctly in LD17. Print from LD22 and compare the parameter values with the information below. (An Option 11 IPE Module does not support an MSDL card.)

- The link is full duplex and synchronous. It uses internal clocking and is a direct connection to the Application Module.
- The speed of the link is 19200 bps.
- If the DTE/DCE configuration is not set up correctly, the AML will not establish. By default, the ESDI or MSDL port is configured as DCE because the Application Module side is configured as DTE.
- IADR must have a value of 3 and RADR must have a value of 1.
- The user type is CMS (Command and Status Link).
- The Value Added Server ID (VAS ID) is a number between 0-15, and must be unique for each ESDI defined.
- The CMS number is an ESDI or MSDL port number between 0 and 15.
- Set LD17 prompts as described in the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210).

9 Check the ESDI or MSDL card option settings.

- If the card is not set up to match the port configuration in LD17, the AML will not come up.
- The ESDI or MSDL port and option switch selection must be set up to match the software configuration in LD17. The socket selection must choose a DCE option and an RS-232 interface.
- Configure the ESDI port or MSDL port to match the configuration in LD17 according to the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210).
- Check the status of the ESDI or MSDL port (see Step 2).

1 0 Check the cabling

- on the Application Module, between the universal or generic I/O panel, or I/O subpanel and the MVME705B transition card
- on the IPE Module, from the I/O panel or connector panel through the octopus cable and extension cable to the ESDL or MSDL card

See the “Cable requirements” chapter in the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210).

1 1 For an Application Module, check the MVME705B transition card option settings.

Verify the physical DTE/DCE configuration. The AML port on the MVME705B card (SP1) must be hardware configured as DTE.

-
- 12 For an Application Module, replace the MVME705B transition card, using the following procedures:
 - Procedure 3: Hardware powerdown
 - Procedure 18: Replace or reconfigure the MVME705B transition card
 - 13 Start up the application by logging in as maint, typing **applstart** and pressing [Return].

X.25 host computer link (Link 1) will not establish

This section applies to Meridian Link only.

The following section describes the steps to take if the X.25 Host Link between the host computer and the Application Module or IPE Module does not establish.

1 Check link status from the Meridian Link.

- Log in as mlusr. If unable to log in, see “Login failure.”
- Check the status of the link.

```
mlusr> status link 1
```

If the response is “Link 1 : Up”, the Host Link is properly connected and the problem is not the Host Link connectivity. Make sure the host application has properly registered (see “Application registration fails”).

If the response is “Link 1 : Disabled”, enable the link.

```
mlusr> enable link 1
```

If the response is “Link 1 : Enabled but down”, the Host Link is properly enabled, but there is something wrong on the host side: either link 1 parameters do not match the host, or the host is down.

If the response is anything other than what is indicated above, or there is no response at all, restart the application.

2 Check the Host Link cable.

Use a straight-through RS-232 cable between the host computer and

- the Host Link port on the IPE Module octopus cable
- card 1 conn 2 on the generic I/O panel, Host on the universal I/O panel, or J3 on the I/O subpanel of the Application Module

Pins 2–8, 15, 17, and 20 are used.

Verify that the length of the cable between the host and the Application Module does not exceed the RS-232 recommended length of 15 m (50 ft). Use external modems if the distance between the Meridian Link Module and the host computer is farther than the maximum recommended cable length. Nortel neither supplies nor recommends a particular make or model for this purpose. If problems exist with the external modems, Nortel recommends that the customer call service representatives for the modem equipment. (A common symptom for an excessive cable length is that the link will establish for only a short period of time.) See the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210) for more information on using modems with the Application Module.

- 3 Verify that the Application Module MVME333-2 XCC card is functional.

If the red LED is lit, see “Diagnostic procedure 3: Card fault suspected” to verify that the MVME333-2 XCC card is indeed bad.

- 4 Check the X.25 communications software.

- Log in as maint, type **version**, and press [Return].
- A list of installed software packages appears. Check that the list contains an entry that reads “MeridianLink & X25 NET333.” If it does not appear, reload the Meridian Link software.

5 Check the Host Link configuration parameters.

- Log in as mlusr and use the display link 1 command to display the current configuration.

mlusr> **display link 1**

The following display appears (default values are shown):

```

Protocol: X25
Machine ID: x25dest
Delay: 0
Port type: X
PDN type: 44
Baud rate: 19200
RFS timer: 150
Remote address: 3
Maximum out frames (K): 7
Local DTE address: 000000990100
Flow control negotiation: 0
Outgoing packet size: 128
Outgoing window size: 2
Incoming throughput class: 10
Lowest LCN for DTE/DCE: -1
Lowest LCN: 1
LOC LIC: -1
T10: 1800
T11: 2000
T13: 1800
T15: 1500
Maximum T12 retries: 3
mlusr> display link 2
Protocol: ASYNC
Machine ID: MeridianMail
Delay: 0
TTY: 3

Link type: 2
Physical DTE(0)/DCE(1): 1
Maximum Frame length: 135
Fail timer: 150
Internal address: 1
T1: 30
Maximum trans attempts (N2): 7
Incoming packet size: 128
Incoming window size: 2
Throughput negotiation used: 0
Outgoing throughput class: 10
DTE/DCE: -1
Highest LCN: 4095
HOC HIC: -1
T12: 1800
T14: 600
T16: 1300
Maximum T13 retries: 3
Link type: 3
```

- The configuration parameters that need to be verified are listed here. These parameter values must be compatible with those defined for the host computer. Contact the host computer administrator for assistance.

Physical DTE(0)/DCE(1) If the Host Link port on the Application Module or IPE Module is configured as DTE, this parameter must be 0. If it is configured as DCE (default), this parameter must be 1.

PDN type This parameter depends on the type of X.25 network used by the host computer. The possible values are as follows:

- 0 — LAPB
- 40 — DATEX-P (Germany)
- 41 — TRANSPAC (France)
- 42 — PSS (United Kingdom)
- 43 — DATAPAC (Sweden)
- 44 — TELENET (USA)
- 45 — DDN (USA)
- 46 — ACCUNET (USA)
- 47 — DATAPAC (Canada)
- 48 — TYMNET (USA)

Maximum frame length This must be identical to the host computer configuration. It specifies the maximum LAPB frame size.

Baud rate This must be identical to the host computer configuration. If external modems are used, it must also match the baud rate of the modem.

Fail timer This specifies the number of milliseconds to elapse before indicating link failure, for monitoring the following signals:

- CTS, DSR, and DCD (if host is configured as DTE)
- DTR and RTS (if host is configured as DCE)

RFS timer This specifies the time value (in milliseconds) for monitoring the following signals after line opening:

- CTS (if host is configured as DTE)
- DTR (if host is configured as DCE)

Internal address If the physical layer is DTE, the internal address is normally 3 and the remote address is 1. If the physical layer is DCE, the internal address is normally 1 and the remote address is 3.

Try establishing the Host Link using the following configurations

- internal = 3/remote = 1
- internal = 1/ remote = 3 .

Remote address (See “Internal address”).

T1 This should be identical to the host computer configuration. It specifies the frame recovery time (in 1/10 second increments).

Maximum out frames (K) This must be identical to the host computer configuration. It specifies the LAPB window size.

Maximum trans attempts (N2) This value should be identical to the host computer configuration. It specifies the maximum number of retries to complete a transmission.

Local DTE address This is the X.25 “call request” address that identifies the Application Module. When the host sends the X.25 call request packet to set up the SVC, it must specify the local DTE address of the Application Module. The default value is 000000990100.

Flow control negotiation This value must be 0. It is the X.25 service which allows flow control parameters (packet size and window size) to be negotiated between

the host and the Application Module. This is not supported by the Application Module. The default value is "0" (no flow control negotiation).

Incoming packet size This must be identical to the host computer configuration. It specifies the maximum X.25 packet size.

Outgoing packet size This must be identical to the host computer configuration. It specifies the maximum X.25 packet size.

Incoming window size This must be identical to the host computer configuration. It specifies the X.25 window size.

Outgoing window size This must be identical to the host computer configuration. It specifies the X.25 window size.

Throughput negotiation used This must be 0.

Incoming throughput class This must be 0.

Outgoing throughput class This must be 0.

Lowest LCN for DTE/DCE This specifies the lowest X.25 virtual circuit number that will be assigned for an incoming (if DTE) or outgoing (if DCE) X.25 call request. It is not used by the Application Module. The default value is -1.

Highest LCN for DTE/DCE This specifies the highest X.25 virtual circuit number that will be assigned for an incoming (if DTE) or outgoing (if DCE) X.25 call request. It is not used by the Application Module. The default value is -1.

Lowest LCN This specifies the lowest X.25 virtual circuit number that will be assigned for an incoming/outgoing X.25 call request. The default value is 1.

Highest LCN This specifies the highest X.25 virtual circuit number that will be assigned for an incoming/outgoing X.25 call request. The default value is 4095.

LOC LIC This specifies the lowest X.25 virtual circuit number that will be assigned for an incoming (if DCE) or outgoing (if DTE) X.25 call request. It is not used by the Application Module. The default value is -1.

HOC HIC This specifies the highest X.25 virtual circuit number that will be assigned for an incoming (if DCE) or outgoing (if DTE) X.25 call request. It is not used by the Application Module. The default value is -1.

T10 This specifies (in 1/10 second increments) the amount of time the application will wait for an X.25 Restart Confirmation packet after sending an X.25 Restart packet to the host (T20 for DTE).

T11 This specifies (in 1/10 second increments) the amount of time the host will wait for an X.25 Call Accept packet from Meridian Link after sending an X.25 Call Request packet (T21 for DTE).

T12 This specifies (in 1/10 second increments) the amount of time the application will wait for an X.25 Reset Confirmation packet after sending an X.25 Reset Request packet to the host (T22 for DTE).

T13 This specifies (in 1/10 second increments) the amount of time the application will wait for an X.25 Clear Confirmation packet after sending an X.25 Clear Request packet to the host (T23 for DTE).

T14 This specifies (in 1/10 second increments) the amount of time the application will wait for a packet with any P(R) value after sending an X.25 Data packet to the host (T24 for DTE).

T15 This specifies (in 1/10 second increments) the amount of time the application will wait for a packet with a P(R) value that acknowledges a transmitted X.25 Data packet to the host (T25 for DTE).

T16 This specifies (in 1/10 second increments) the amount of time the application will wait for an X.25 Interrupt Confirmation packet after sending an X.25 Interrupt Request packet to the host (T26 for DTE).

Maximum T12 Retries This specifies the maximum number of times the application will send Reset Requests due to T12 time outs (R12 for DCE and R22 for DTE).

Maximum T13 Retries This specifies the maximum number of times the application will send Clear Requests due to T13 time outs (R13 for DCE and R23 for DTE).

- 6 Have the host computer programmer verify the X.25 call request packet format as follows:
 - The Called DTE address must match the address specified in the Host Link (Link 1) configuration file.

- No facilities should be specified.
- No user data should be specified.

7 Check the physical DTE/DCE configuration.

If the host computer is physically DTE, the Host Link port on the IPE Module or MVME705B transition card (SP3) in the Application Module must be configured as DCE (this is the default). If the host computer is configured as DCE, the IPE Module or transition card must be configured as DTE.

If modems are used, both the Application Module and the host computer connections should be configured as DTE.

Perform the following steps to configure the Host Link (link 1) on the Application Module as DCE or DTE.

- Perform Procedure 3: Hardware powerdown.
- Perform Procedure 18: Replace or reconfigure the Application Module MVME705B transition card.
- Perform Procedure 4: Power up the Application Module or IPE Module.
- Log in as mlusr and verify that the physical DTE/DCE configuration parameter matches the DTE/DCE configuration on the MVME705B transition card as follows:

```
mlusr> display link 1
```

- Use the following command to change the physical DTE/DCE address:

```
mlusr> change link 1
```

Perform the following steps to configure the Host Link (link 1) on an IPE Module as DCE or DTE.

- Log in as mlusr and verify that the physical DTE/DCE configuration parameter matches the configuration on the CPU adapter card in the IPE Module. (Use Procedure 15, "Remove the IPE Module," if necessary.)

```
mlusr>display link1
```

- Use the following command to change the physical DTE/DCE address:

```
mlusr> change link 1
```

8 Verify link configuration with host computer configuration.

- 9 Check the Application Module MVME333-2 XCC card jumper settings as follows:
 - Perform Procedure 3: Hardware powerdown.
 - Perform Procedure 11: Replace the MVME333-2 XCC card (without actually replacing the card).
 - Perform Procedure 4: Power up the Application Module or IPE Module.

TCP/IP host computer link (Link 1) will not establish

This section applies to Meridian Link only.

The following section describes the steps to take if the TCP/IP Host Link between the host computer and the Application Module or IPE Module does not establish.

Check link status from the Meridian Link.

- Log in as mlusr. If unable to log in, see the section “Login failure” earlier in this chapter.
- Check the status of the link by typing **status link 1** in the mlusr prompt.

If the response is “Link 1 : Up”, the Host Link is properly connected and the problem is not the Host Link connectivity. Make sure the host application has properly registered (see “Application registration fails”).

If the response is “Link 1 : Enabled but down”, it is possible that no applications are registered.

- Perform a loopback test as described in Chapter 3, “Link maintenance commands”. If there is no response to the ping command, contact your system administrator.
- Restart the application.

If neither of the above steps gives you the message “Link 1: Up”, contact your Nortel support personnel.

If the response is “Link 1 : Disabled”, enable the link by typing **enable link1** in the mlusr prompt.

Meridian Mail Link (Link 2) will not establish

The following section describes the steps to take if the link between Meridian Mail and the Application Module does not establish.

1 Check link status from the Meridian Link.

- Log in as mlusr. If unable to log in, see the section “Login failure” earlier in this chapter.
- Check the status of the link.

```
mlusr> status link 2
```

If the response is “Link 2 : Up”, the Meridian Mail Link is properly connected and the problem is not the Meridian Mail Link connectivity. Make sure the host application has properly registered (see “Application registration fails” later in this chapter).

If the response is “Link 2: Disabled”, enable the link.

```
mlusr> enable link 2
```

If the response is “Link 2: Enabled but down”, the Meridian Mail Link is properly enabled, but there is something wrong with Meridian Mail.

If the response is anything other than indicated above, or there is no response at all, restart the application.

2 Check the Meridian Mail Link cable.

3 Verify that the card used for the Meridian Mail Link connection is functional. Follow Diagnostic procedure 2: Card fault suspected.

4 Check the SEER (System Event and Error Report) log on the Meridian Mail system for SEERs related to “TC” or “TKM”. If such SEERs have been reported, follow the instructions described in the *Meridian Mail System Event and Error Report* (NTP 555-7001-510).

5 Check the ACCESS diagnostic tool, described in the *Meridian Mail System Administration Tools* (NTP 555-7001-305), to check the link from Meridian Mail.

Meridian Link application malfunction

An application malfunction denotes the failure of the host-based application. Given that the base Application Module or IPE Module is operational (UNIX is loaded, application software is running, and both link 0 and link 1 are up), if the host application does not perform as desired, the failure is classified as an application failure. The following sections describe how to treat such failures.

Application registration fails

Make sure services expected by the host computer are on the distribution tape. See tape labels and verify with the host programmer.

- 1 Application registration can only take place after Meridian Link has successfully started on the Application Module or IPE Module and the link between the host and the application (link 1) is up. Verify that the Host Link is up by logging in as mlusr and typing the following:

```
mlusr> status link 1
```

Press [Return]. If the response is "Link 1 : Up", the Host Link is up. Otherwise, refer to "X.25 Host Link (link 1) will not establish" or "TCP/IP Host Link (link 1) will not establish."

- 2 If the host link is up, analyze the Application Registration Response message returned by the application in response to an Application Registration message sent by the host application.

A message trace of the Host Link can be set up by using the trace facility on the application. To turn on the trace, log in as mlusr and type the following:

```
mlusr> trace link 1
```

Press [Return]. Have the host application attempt the application registration. Turn off the trace when the host application has finished attempting the registration and type the following:

```
mlusr> untrace link 1
```

Press [Return]. Use the view command to look at the trace file.

Normally there will be at least two messages displayed: an Application Registration message and an Application Registration Response message.

- 3 If there is no response, verify that the association ID located in byte five of the Application Registration message is set to 00.

Also verify that the following bytes appear somewhere in the Application Registration message: 05 09 78 32 35 64 65 73 74. Inform the host application programmer if there is a problem.

- 4 If the last three bytes of the Application Registration Response message are 71 03 00, the application has registered successfully.
- 5 If the last four bytes of the Application Registration Response message (it might be an "Invalid Message" message) are 78 04 XX XX where XX XX is any number, the registration has failed.

The cause of the failure can be determined from the cause value (the last two bytes, for example, 0003) of the message. The information below describes a course of action to take for each cause value listed.

N Host vendors can refer to the Meridian Link Interface

Specification for information on decoding Meridian Link messages.

t
e
:

- 0003 indicates Meridian Link did not recognize the message from the host application. Verify that the message type in the Application Registration message located in bytes eight and nine contains the hexadecimal value 0101.
- 0004 indicates unrecognized information was found in the Application Registration message. Verify that the Application Registration message only contains the following information
 - Header
 - Service ID
 - Process ID
 - Association password
 - Host ID
 - MSL-1 Machine ID
 - MSL-1 Customer number
- 0006 indicates information is missing from the Application Registration message. Verify that the message contains at least the following information
 - Header
 - Application protocol
 - Application ID
 - Service ID
- 0008 indicates the message length contained in bytes three and four of the Application Registration message is not correct. The message length is the size in bytes of the entire message.
- 0502 the limit for the number of applications that can register has been reached. Reboot the Application Module or IPE Module.
- 0504 indicates the application has already registered. The application can either continue to use the existing registration or release the application (by sending the Application Release message) and register the application again.
- 0505 indicates the Machine ID value specified in the Application Registration message is not valid. The value must be x25dest or must match the value in the Machine ID link parameter in ASCII format.

- 0506 indicates the Meridian 1 ID value specified in the Application Registration message is not valid. The value must be SL16 in ASCII format. Link 0 must also be configured on the Application Module or IPE Module. To verify if link 0 is configured, log in as mlusr and type the following

mlusr> **get links**

Press [Return]. The following display appears:

```

                Number of Links: 3
Link ID:                0
Link Type:               MSL-1 link
Machine ID:              SL16

Link ID:                1
Link Type:               Host link
Machine ID:              x25dest (or Lanlink)

Link ID:                2
Link Type:               MMail link
Machine ID:              MeridianMail

```

If the entry for Link ID: 0 does not exist, see “AML (link 0) will not establish” earlier in this chapter to diagnose the establishing of link 0.

- 0507 indicates that the Service ID specified in the Application Registration message is not available on the Meridian Link software installed on the Application Module or IPE Module. The possible Service ID values are 95, 96, 97, 98, 100 and 101.

Meridian Link call processing functions fail

If an application's attempts to control calls (for example, Make Call, Release, Answer) at a DN fail, it is possible that the Meridian 1 database or the application software is not configured correctly, or that the application software is not equipped with the required packages.

Check Meridian Link Module software option services

The application software tape lists the options or services purchased.

- Inbound and outbound call management (package 96)
This package cannot be ordered but will be supplied if packages 97 and 98 are both ordered (for compatibility with older host applications). Service 96 may appear in the list of base services when the showid command is issued.
- Inbound call management (package 97)
An application has access to all Application Module or IPE Module messages except Make Call. That is, an application cannot originate an outgoing call on behalf of a DN. Transfer and Conference of existing calls are permitted.
- Outbound call management (package 98)
An application has access to all the Application Module messages except Call Offered. That is, an application will not receive an incoming Call Offered message when a call is terminated on an ACD agent.
- Host Enhanced Routing (package 100)
This package supports the Route Request and Route Call messages, giving the host application the ability to route incoming calls.
- Host Enhanced Voice Processing (package 101)
This service gives the host the ability to control Meridian Mail voice ports for IVR (Interactive Voice Response) type applications. The host is then able to acquire voice ports, receive notification of calls presented to voice ports, answer such calls, play voice segments to the caller, collect DTMF digits from the caller, release the call or transfer it to another DN. New Meridian Link messages have been defined to enable the host to use this functionality.

Check application registration

The application must register with the application software to gain access to Application Module (AM) services.

- Log in as mlusr.
- Use the get associations command to display all the applications currently registered with application software.
- Make sure the application is registered with the appropriate service:
 - 95 = Pass-through OR
 - 96 = inbound and outbound OR
 - 97 = inbound call management
 - 98 = outbound call management
 - 100 = host enhanced routing
 - 101 = host enhanced voice processing

Check telephone configuration

- Verify LD23 configuration: AST=YES, ISAP=YES, and VSID=VAS ID assigned to ESDI or MSDI link.
- Target DNs must be configured as AST if an application wishes to control the telephone. Use LD10 or LD11 as required for telephone configuration.

-
- Each telephone must be configured with the appropriate class of service or feature keys that the application tries to invoke on that telephone. For instance, if the application tries to transfer a call, the telephone must possess a TRN key.
 - Make sure GRPs, VSID (LD15), and IAPG (LD10/11) are set correctly for status change messages. (Verify assignments with the application programmer.)
 - Make sure DNIS is defined correctly (LD14, LD15, and LD16).

Meridian Link-based applications do not receive expected messages

Some of the messages received by a Meridian Link-based application from the Meridian 1 are unsolicited due to events that occur on devices (ringing, answering, and so on). Some messages are responses from the application software after the application has requested a service.

Because the Application Module or IPE Module can handle multiple applications at the same time, if an application does not have the correct configuration, it will not receive the expected messages. Follow the procedures below to find out why the application is not receiving the expected messages.

AM debugging tools (trace, monitor, record, filter)

The following list explains the tools available to track the flow of messages between the application and the Application Module or IPE Module. See Chapter 3, “Link maintenance commands” for information on using the tools.

- The trace command allows application software to capture all the messages flowing over a link (or through the Application Module or IPE Module) to files. The messages are represented in hexadecimal format. The file specified in the trace command is stored in the /usr/mlusr/trace directory.
- The monitor command allows application software to monitor all or a selective subset of application messages flowing on a particular association on the system console.
- The record command allows the application software to record all or a selected set of messages flowing on a particular association to a file. The record command is activated on a per-association basis. The file specified in the record command is stored in the /usr/mlusr/rec directory.
- The filter command allows the application software to filter out a selected set of application messages that flow on a particular association through the Application Module or IPE Module.

Check application and DN registration

The application must register with the application software to gain access to the application services.

- Log in as mlusr.
- Use the get associations command to display all the applications and their association IDs.
- If the application software does not display any information related to applications on the system console other than “ADMIN Application,” the application is not registered. An application must be registered before it can register DNs associated with that application.
- If the application software displays information related to application registrations, use the get dn command to display the DNs registered with that application.

Because Meridian Link software handles multiple applications simultaneously, unsolicited messages from the Meridian 1 to the application software must be routed to the applications that have registered for the DN. If the application is not registered for the DN, the Application Module or IPE Module cannot route the message.

Check Meridian 1 configuration

If the telephone configuration on the Meridian 1 is not correct, the Meridian 1 will not send any messages to the Application Module or IPE Module. For the application to receive a particular type of message, the feature must be turned on. See the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210) for information on turning on a particular feature.

Use LD48 to see if the Meridian 1 is sending or receiving expected AML messages. For example (AML connected to ESDI port 9):

>LD48

.ENL MSGI 9 (trace inbound messages on port 9)

.ENL MSGO 9 (trace outbound messages on port 9)

N Using these commands during a high-traffic period may impact
service.
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In this example, messages flowing in and out of port 9 will be displayed on the Meridian 1 console in hexadecimal format. To turn tracing off, do the following:

.DIS MSGI 9

.DIS MSGO 9

Check ACD configuration

If an application is not receiving messages on behalf of an ACD set (such as Call Offered, Answer Indication, or Release Indication), the ACD group is not configured correctly. See the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210) for configuration details.

Check Unsolicited Status Message configuration

If an application does not receive Status Change messages on behalf of a monitored device, the Unsolicited Status Messages (USM) feature may not be configured correctly. See the *Meridian Link/Customer Controlled Routing Installation and Upgrade Guide* (NTP 553-3202-210) for configuration details.